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U.S. Department of Agriculture

~~*~~ 1968 BUDGET

EXPLANATORY NOTES ~~*~~

FOREST SERVICE

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FOREST SERVICE

Purpose Statement

The Forest Service is responsible for promoting the conservation and wise use of the country's forest and related watershed lands, which comprise one-third of the total land area of the United States. To meet its responsibility the Forest Service engages in three main lines of work, as follows:

1. Management, protection, and development of the National Forests and National Grasslands. The National Forests and National Grasslands are managed under multiple use and for sustained yield. Under these principles natural resources of outdoor recreation, range, timber, watershed, and wildlife are utilized in a planned combination that will best meet the needs of the Nation without impairing the productivity of the land. Gross area within unit boundaries encompasses about 226 million acres in 44 States and Puerto Rico, of which some 186 million acres are under Forest Service administration.

In managing the National Forests, technical forestry is applied to the growing and harvesting of timber crops. Grazing use is managed to obtain proper range conservation along with utilization of the annual growth of forage. Watersheds are managed to regulate stream flow, prevent floods, and provide water for power, irrigation, navigation, and municipalities. Management includes the handling of the millions of people who visit the National Forests each year for recreation purposes. Wildlife habitat is managed to provide a suitable land and water environment for both game and non-game wildlife.

Under the multiple use principles most areas are used for, or serve, more than one purpose or objective. For example, about 50% of the area within the National Forests serves five different purposes:

- (a) Timber production
- (b) Watershed protection
- (c) Forage production
- (d) Wildlife production
- (e) Recreation

An additional 28% serves four purposes in varying combinations. Of the remainder, 21% of the total serves three purposes with only 1% of the total reserved exclusively for a single purpose, mainly campgrounds and special use areas, such as summer homesites, pastures, and corrals. The varied interests which frequently conflict and which must be reconciled, and the vast areas covered, clearly require careful planning and skillful management of the National Forest properties.

The protection of the National Forests includes the control of forest fires, the control of tree disease and insect epidemics, and the prevention of trespass.

The major development activities of the National Forests are reforestation; timber stand improvement; revegetation; construction of roads, recreational facilities, range and other necessary improvements; and land acquisition and exchanges.

The economic importance of the National Forests and National Grasslands is evident when it is considered that:

- (a) They produced a cash income in fiscal year 1966 of over \$175.6 million. Approximately 65% of this amount is credited to the general fund in the Federal Treasury (miscellaneous receipts). The remainder is distributed in accordance with special acts of Congress, including 25% to the States or counties in which lands are located, and 10% made available for construction and maintenance of the Forest Service system of roads and trails. In addition to these cash receipts, there are the even greater economic values which result from the processing of end products derived from this utilization of National Forest timber, forage, and minerals. There are also the important values of water, recreation, and wildlife which cannot be readily expressed in monetary terms.
- (b) The area within National Forests boundaries is equivalent to some 10% of the area of the continental United States. Over 40% of this land is within areas now experiencing economic distress. Proper management, development, and utilization of these lands are important factors in permanent improvement of these local economies. Millions of people who live in and near the National Forests are supported in whole or in part through the economic development arising from the forests and their resources.
- (c) The National Forests supplied 12.1 billion board feet of timber in fiscal year 1966 to the Nation's forest products industries. This is expected to increase to 12.5 billion board feet in 1967. Dependence of the forest products industries on National Forest timber continues to increase as the result of depletion of good quality timber on private lands.
- (d) About 7 million head of domestic livestock (including calves and lambs) are grazed on the National Forests and Grasslands.
- (e) These lands provide protection to municipal water supplies for nearly all western cities and towns and many in the east, to irrigation water used on about 20 million acres of western lands, and to many streams with water power developments. They provide flood protection to thousands of acres of rich valley lands and help to prevent more rapid siltation of reservoirs and stream channels.
- (f) They provide a habitat for a large part of the big game animal population, for birds, for millions of small game animals and fur-bearing animals, and for fish.
- (g) They provide opportunities for healthful outdoor recreation, with a minimum of restrictions.

2. Forestry research. The Forest Service conducts research in the entire field of forestry and the management of forest and related ranges. This includes the growth and harvesting of timber, its protection from fire, insects, and diseases, the protection and management of watersheds, and improved methods for development and management of recreation resources. It conducts studies in forest economics, marketing of forest products, and a survey of the present extent and potential growth and use of the Nation's forest resources. It also conducts research to develop new and improved products from wood, to increase efficiency of utilizing forest products, and to advance the efficiency and mechanization of forestry operations.

The research program has a two-fold objective:

- (a) To backstop the National Forest development program by devising more efficient practices for protecting, managing, and utilizing forest resources.
- (b) To develop new and improved practices that will lead to sounder uses of forests in other public and private ownerships and more efficient and profitable utilization and marketing of forest products.

The Forest Service also cooperates with the Agricultural Research Service of the Department by reviewing and appraising for technical adequacy forest research projects beneficial to the United States which are conducted abroad. These projects are carried out with foreign currencies under Section 104(b, (3) of Public Law 480, as amended, and the dollar expenses of the Forest Service in connection with this work are paid from the appropriation "Forest Protection and Utilization."

Results of research are made available to owners of private forest and range lands, to public agencies which administer such lands, to forest product industries, and to consumers.

3. Cooperation with State and private forest landowners. The Forest Service cooperates with State agencies and private forest owners to:

- (a) Better protect the 446 million acres of State and privately owned forests and critical watersheds against fires, insects, and diseases.
- (b) Encourage better forest practices, both for resource conservation and profit, on the 367 million acres of private forest land.
- (c) Aid in the distribution of planting stock for forests, shelterbelts, and wood lots.
- (d) Stimulate development and proper management of State, county, and community forests.
- (e) Assist the harvesters, processors, and marketers of forest products in doing a better job and thereby bring about greater use of forest products and increased income and employment for rural people.

- (f) The Forest Service also provides assistance to States for tree planting under Section 401 of the Agricultural Act of 1956 (16 USC 568e), through the State forester or equivalent State official, including advice, technical assistance, and financial contributions for increased tree planting and reforestation work, in accordance with plans submitted by the State and approved by the Secretary of Agriculture.

Other work related to forestry includes:

4. Insect and disease control. Activities to suppress and control destructive insects and diseases that threaten timber areas include two types of work carried on jointly by Federal, State, and private agencies:
 - (a) Surveys on forest lands to detect and evaluate infestations of forest insects and infections of tree diseases and determination of protective measures to be taken.
 - (b) Control operations to suppress or eradicate forest insects and diseases, including white pine blister rust.
5. Flood prevention and watershed protection. The Forest Service cooperates with the Soil Conservation Service, appropriate State agencies and the local organizations sponsoring small watershed protection projects initiated under the Watershed Protection and Flood Prevention Act of 1954, as amended, (PL 83-566) in planning and installing forestry and related land resource measures on the watersheds. The Forest Service also collaborates with the Soil Conservation Service, other Federal and State agencies in the conduct of comprehensive river basin studies relating to the development of water and related land resources under authority of PL 89-80 and section 6, PL 83-566.

On National Forest lands and on non-Federal forest lands within the watersheds authorized for treatment by the Department of Agriculture under the Flood Control Act of December 22, 1944, the Forest Service plans and installs watershed improvement measures, in the form of minor physical structures, cultural measures, and intensified fire control, to retard runoff and reduce flood water and sediment damage. Work on non-Federal land is carried on in cooperation with the Soil Conservation Service and the appropriate State and local agencies.

This work is performed with funds allotted to the Forest Service by the Soil Conservation Service.

6. Job Corps Conservation Centers. The Forest Service operates 47 Job Corps Conservation Centers on National Forests throughout the United States under agreement with the Office of Economic Opportunity. The Forest Service provides the staffing, administration and logistical support to physically operate and maintain the Centers and conduct the basic education, plan and supervise the recreation, and fully implement the vocational training of corpsmen. The funds for this program are transferred from OEO. There are 32 to 64 permanent staff assigned to each Center based upon enrollee capacity of 112 to 256. Total capacity of all Centers is 8,388 corpsmen and Centers operate on a 24-hour, seven-day week basis. Both human and natural resources are being upgraded through these Conservation Centers, as young men improve their education and job skills in preparation for a more productive life.

7. Timber stand improvement. Funds collected from timber purchasers in connection with timber sales, under authority of the Knutson-Vandenberg Act, make possible some timber stand improvement work on cut-over areas each year looking to the establishment of natural tree growth and protecting it through the critical period of early growth. This work also helps to obtain stocking of trees of desirable species, form and quality. Timber stand improvement in promising young growth not associated with timber sale cuttings is done with funds directly appropriated by Congress.
8. Brush disposal. National Forest timber sale contracts require treatment of debris from cutting operations or deposit of funds to pay for the work. If it is not feasible for the timber purchaser to dispose of the logging slash, which is the case in most sales, it is done by the Forest Service using deposits made by the purchaser. This work is essential because logging slash increases the fire hazard and may contribute to the buildup of insect populations, increase certain disease infestations, and cause damage to stream channels.
9. Land and Water Conservation Fund. This fund, transferred from the appropriation made to the Department of the Interior, finances the acquisition of lands, waters, or interests in lands or waters by the Forest Service as well as certain other Federal agencies. The Act creating the fund from which appropriations are made requires that the lands and waters acquired be primarily of value for outdoor recreation. The fund derives revenues from admission and user fees, sales of surplus real property, and motor boat fuel tax. The first purchase of recreation land made by the Forest Service was on October 19, 1965.
10. Rural fire defense. The Forest Service, as a part of its regular programs, also directs Federal activities and provides technical guidance and training to States concerned with the prevention and control of fires which might be caused by an enemy attack in rural areas of the United States.
11. Timber development organization loans and technical assistance. Under Section 204 of the Appalachian Regional Development Act of 1965, the Forest Service provides technical assistance and loans to timber development organizations to improve development and utilization of timber stands in the Appalachian region.

ORGANIZATIONAL STRUCTURE

The Forest Service maintains its central office in Washington, with program activities decentralized to 9 regional offices, 130 forest supervisors' offices, 817 district rangers' offices, 2 State and private forestry area offices, 8 forest and range experiment stations, the Institute of Tropical Forestry, and the Forest Products Laboratory. Location of headquarters offices:

Regional offices:	Missoula, Montana	Portland, Oregon
	Denver, Colorado	Atlanta, Georgia
	Albuquerque, New Mexico	Milwaukee, Wisconsin
	Ogden, Utah	Juneau, Alaska
	San Francisco, California	

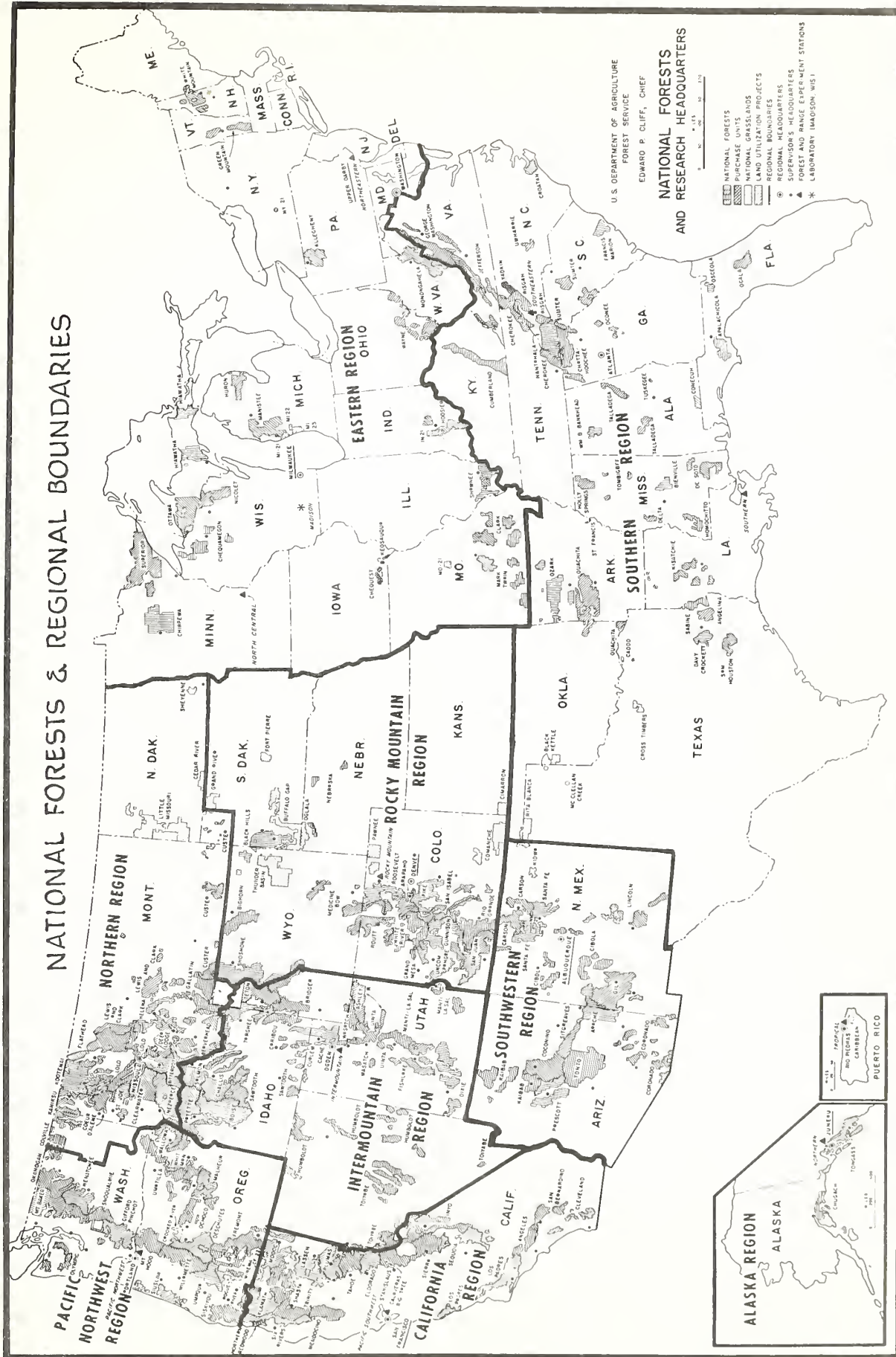
State and private forestry area offices: Upper Darby, Pennsylvania
Atlanta, Georgia

Experiment stations:	Ogden, Utah	Berkeley, California
	St. Paul, Minnesota	Fort Collins, Colorado
	Upper Darby, Pennsylvania	Asheville, North Carolina
	Portland, Oregon	New Orleans, Louisiana

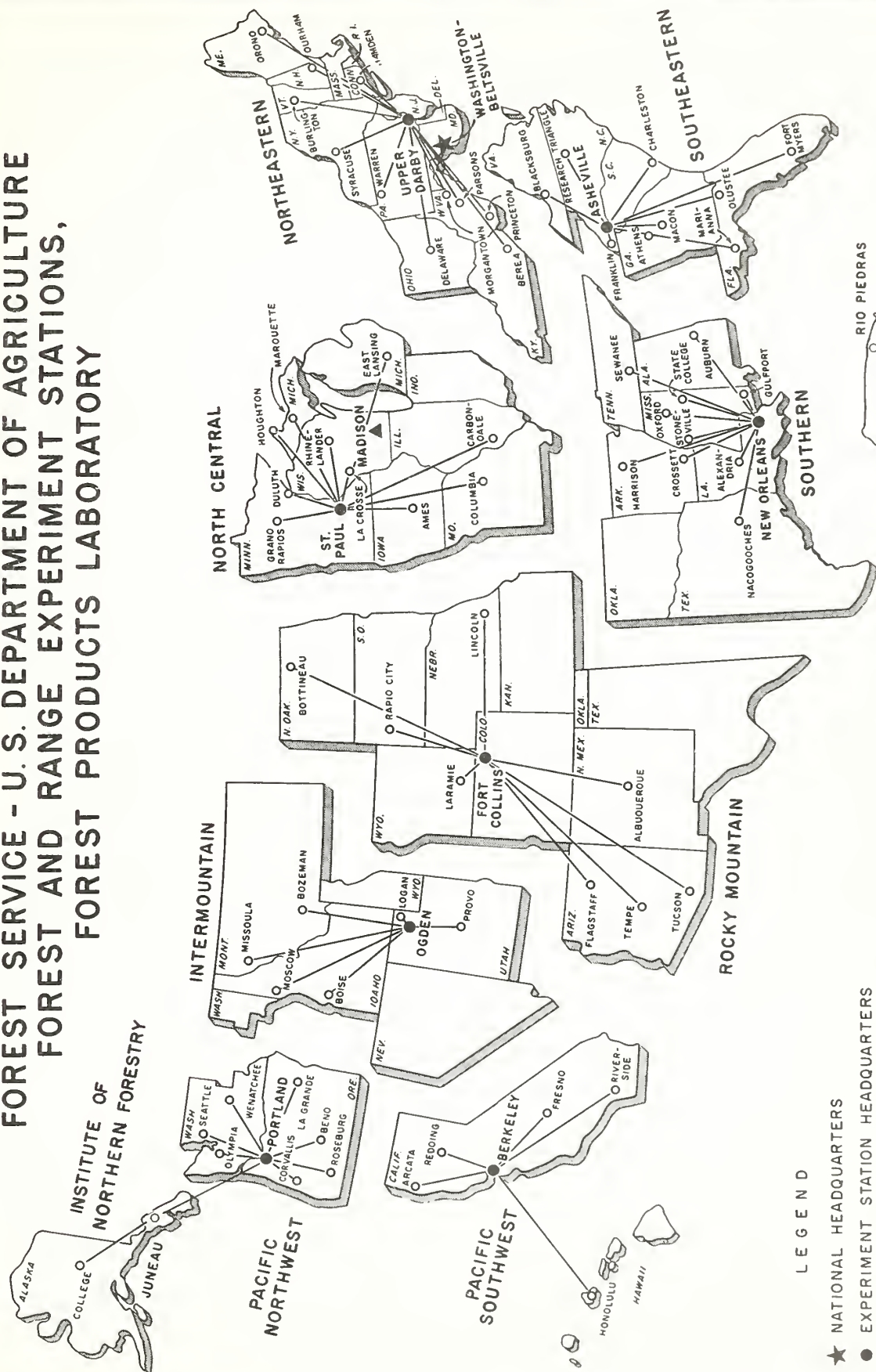
Forest Products Laboratory: Madison, Wisconsin

Institute of Tropical Forestry: Rio Piedras, Puerto Rico

NATIONAL FORESTS & REGIONAL BOUNDARIES



FOREST SERVICE - U. S. DEPARTMENT OF AGRICULTURE FOREST AND RANGE EXPERIMENT STATIONS, FOREST PRODUCTS LABORATORY



RIO PIEDRAS

PUERTO RICO

INSTITUTE OF
TROPICAL FORESTRY

LEGEND

- ★ NATIONAL HEADQUARTERS
- EXPERIMENT STATION HEADQUARTERS
- ▲ FOREST PRODUCTS LABORATORY
- RESEARCH PROJECT LOCATIONS

Summary of Estimated Appropriations and Receipts

Page	Item	Available 1966	Estimated Available 1967	Budget Estimates 1968	Increase or Decrease 1968 over 1967
	<u>Appropriated Funds</u>				
	Forest protection and utilization:				
21	Forest land management	\$171,652,000	\$178,388,000	\$186,238,000	+\$7,850,000
75	Forest research	37,272,000	38,459,000	40,032,000	+1,573,000
110	State and private forestry cooperation	17,558,000	18,151,000	18,251,000	+100,000
	a/		c/		
122	Total, Forest protection and utilization b/	226,582,000	234,998,000	244,521,000	+9,523,000
125	Forest roads and trails a/	102,136,000	101,230,000	110,500,000	+9,270,000
127	Acquisition of lands for National Forests, Special Acts	80,000	80,000	80,000	-
127	Acquisition of lands for Uinta National Forest	-	300,000	-	-300,000
131	Cooperative range improvements	700,000	700,000	700,000	-
132	Assistance to States for tree planting a/	1,000,000	1,000,000	1,000,000	-
	<u>Permanent Appropriations</u>				
143	Expenses, brush disposal a/	10,195,672	10,200,000	10,300,000	+100,000
142	Roads and trails for States, National Forests Fund	14,203,671	16,778,480	17,160,000	+381,520
145	Forest fire prevention a/	43,046	45,000	45,000	-
147	Restoration of forest lands and improvements a/	19,795	25,000	25,000	-
148	Payment to Minnesota (Cook, Lake, and St. Louis Counties) from the National Forests Fund	140,619	144,815	145,000	+185
149	Payments to counties, National Grasslands	429,041	431,250	431,250	-
150	Payments to school funds, Arizona and New Mexico	112,130	102,931	105,000	+2,069
151	Payments to States, National Forests Fund	35,504,367	41,942,319	42,900,000	+957,681
	Total	391,146,341	407,977,795	427,912,250	+19,934,455
	Deduct permanent appropriations shown above	60,648,341	69,669,795	71,111,250	+1,441,455
	Total (excluding permanent appropriations)	330,498,000	338,308,000	356,801,000	+18,493,000
	<u>Receipts d/</u>				
	Timber sales	164,936,546	168,700,000	171,500,000	+2,800,000
	Grazing and power	3,431,808	3,510,000	3,515,000	+5,000
	Recreation	1,917,394	1,925,000	1,950,000	+25,000
	Land uses	3,119,609	3,220,000	3,310,000	+90,000
	Admission and user fees	495,741	425,000	425,000	-
	National grasslands and land utilization	1,715,330	1,725,000	1,725,000	-
	Total receipts	175,616,428	179,505,000	182,425,000	+2,920,000

(Footnotes on next page)

Footnotes

a/ In addition, prior year balances are available.

b/ Includes following: Fighting forest fires -- 1966, \$7.5 million provided in Second Supplemental Appropriation Act, 1966, PL 89-426

Excludes following: Fighting forest fires -- 1967, \$25 million proposed supplemental Space transfers to General Services Administration -- 1966, \$303,000
1967, \$427,000

c/ Includes following: Supplemental Appropriation Act, 1967 -- \$2.3 million, Forest land management, sales administration and management
\$0.2 million, State and private forestry cooperation, general forestry assistance

Proposed supplemental, 1967 -- \$3,357,000 for increased pay costs, PL 89-504

d/ Amounts include:

	<u>1966</u>	<u>1967</u>	<u>1968</u>
Suspense account, Alaska <u>1/</u>	\$1,091,494	\$1,100,000	\$1,100,000
Suspense account, O&C Lands <u>2/</u>	5,966,117	6,000,000	6,000,000

1/ Account established pending settlement of Indian rights on Tongass National Forest, Alaska.

2/ Account established for Oregon and California railroad grant lands, for which receipts are transferred to Department of the Interior for distribution under the Acts of August 28, 1937, June 24, 1954, and August 3, 1961 (43 USC 1181f-g).

DEVELOPMENT PROGRAM FOR THE NATIONAL FORESTS

Cumulative Fiscal Years 1963-1967

(In thousands of dollars)

(The planned levels indicated in this table were developed by the Forest Service and were not specifically indicated in the program submitted by the President on September 21, 1961. This program stated that it would "be carried out as rapidly as possible within overall budgetary requirements and financial resources of the Federal Government.")

	: 1963-1967:		1963-1967 Available		:	:	:	:	:	:
	: Planned	: Forest Service	: Public:	:	:	:	:	:	:	: Percent
	: Level	: Appropriation	: Works	: Total	: Difference:	: Financial	:	:	:	:
FOREST LAND MANAGEMENT:										
National Forest Protection and Management:	:	:	:	:	:	:	:	:	:	:
Timber resource management:	:	:	:	:	:	:	:	:	:	:
(a) Sales administration and management	: \$154,001:	: \$147,994	:	: \$147,994:	: - \$6,007:	: 96.1	:	:	:	:
(b) Reforestation and stand improvement	: 179,037:	: 82,967	: \$5,294:	: 88,261:	: -90,776:	: 49.3	:	:	:	:
Recreation-public use	: 288,176:	: 137,882	: 10,611:	: 148,493:	: -139,683:	: 51.5	:	:	:	:
Wildlife habitat management	: 28,736:	: 18,618	: 1,637:	: 20,255:	: -8,481:	: 70.5	:	:	:	:
Range resource management:	:	:	:	:	:	:	:	:	:	:
(a) Management	: 29,513:	: 26,007	:	: 26,007:	: -3,506:	: 88.1	:	:	:	:
(b) Revegetation	: 15,667:	: 13,844	: 46:	: 13,890:	: -1,777:	: 88.7	:	:	:	:
(c) Improvements	: 22,143:	: 16,630	: 1,986:	: 18,616:	: -3,527:	: 84.1	:	:	:	:
Soil and water management	: 50,646:	: 29,804	: 1,206:	: 31,010:	: -19,636:	: 61.2	:	:	:	:
Mineral claims, leases, and special uses	: 21,920:	: 19,346	:	: 19,346:	: -2,574:	: 88.3	:	:	:	:
Land classification, adjustments, and surveys ..	: 35,502:	: 21,639	:	: 21,639:	: -13,863:	: 61.0	:	:	:	:
Forest fire protection	: 153,518:	: 118,411	: 1,187:	: 119,598:	: -33,920:	: 77.9	:	:	:	:
Structural improvements for fire and general purposes (construction and maintenance)	: 80,787:	: 56,105	: 16,715:	: 72,820:	: -7,967:	: 90.1	:	:	:	:
Total, National Forest Protection and Management .	: 1,059,646:	: 689,247	: 38,682:	: 727,929:	: -331,717:	: 68.7	:	:	:	:
Insect and Disease Control:	:	:	:	:	:	:	:	:	:	:
White pine blister rust control	: 21,019:	: 18,032	: 51:	: 18,083:	: -2,936:	: 86.0	:	:	:	:
Other pest control	: 35,960:	: 41,612	: 146:	: 41,758:	: +5,798:	: 116.1	:	:	:	:
Total, Insect and Disease Control	: 56,979:	: 59,644	: 197:	: 59,841:	: +2,862:	: 105.0	:	:	:	:
Acquisition of Lands, Weeks and Special Acts	: 27,425:	: 9,332	:	: 9,332:	: -18,093:	: 34.0	:	:	:	:
Forest Roads and Trails (including all related appropriations) (obligating authority)	: 611,753:	: 429,997	: 18,719:	: 448,716:	: -163,037:	: 73.3	:	:	:	:
TOTALS	: 1,755,803:	: 1,188,220	: 57,598:	: 1,245,818:	: -509,985:	: 71.0	:	:	:	:

OFFICE OF ECONOMIC OPPORTUNITY (JOB CORPS)

Transfers to Forest Service

	Available 1966		Estimate 1967		Estimate 1968	
	No. of	Amount	No. of	Amount	No. of	Amount
	Permanent	(in	Permanent	(in	Permanent	(in
	Positions	thousands)	Positions	thousands)	Positions	thousands)
Center construction and equipment	- -	\$21,862	- -	\$2,075	- -	\$2,000
Center operation	1,763	30,191	2,123	42,967	2,123	43,000
Program direction and training	154	1,899	154	2,120	154	2,200
Total	1,917	53,952	2,277	47,162	2,277	47,200

Amounts Programed for Appalachia
(In thousands of dollars)

	1966			1967			1968		
	1966			1967			1968		
	National Program Total 1/ 2/	Normal Appalach- ian Portion	Accelerated Appalachian Program (obligations)	National Program Total 1/ 2/ 3/	Normal Appalach- ian Portion	Accelerated Appalachian Program (appropriation)	National Program Total 1/ 2/	Normal Appalach- ian Portion	Accelerated Appalachian Program (estimate)
Forest Protection and Utilization:									
Forest Land									
Management	165,153	10,107	1,915	177,607	10,870	1,800	185,138	11,330	1,800
Forest Research ..	37,374	2,792	1,063	37,988	2,840	579	39,427	2,945	593
State and Private Forestry									
Cooperation	17,558	1,942	304	17,829	1,970	322	17,929	1,983	322
Subtotal, Forest Protection and Utilization ...	220,085	14,841	3,282	233,424	15,680	2,701	242,494	16,258	2,715
Forest Roads and Trails	95,536	3,816	2,250	104,731	3,990	2,250	134,969	5,142	2,191
Timber Development, Organization Loans and Technical Assistance	-	-	4	-	-	200	-	-	746
Total	315,621	18,657	5,536	338,155	19,670	5,151	377,463	21,400	5,652

1/ Includes \$700,000 for Cooperative Range Improvements and following transfers to GSA for space:

	1966	1967
Forest land management	\$301,000	\$319,000
Forest research	2,000	108,000
	303,000	427,000

2/ Excludes amounts shown in Accelerated Appalachian Program column and supplementals for fighting forest fires and Pacific Northwest flood damages.

3/ Includes proposed supplemental of \$3,357,000 for pay costs.

FOREST PROTECTION AND UTILIZATION

	Forest Land Management	Forest Research	State and Private Forestry Cooperation	Total
Appropriation Act, 1967	\$176,150,000	\$37,821,000	\$18,097,000	\$232,068,000
Proposed supplemental, 1967, for increased pay costs	+2,557,000	+746,000	+54,000	+3,357,000
Transferred to "Operating Expenses, Public Building Service, General Services Administration" for space rental	-319,000	-108,000	-	-427,000
Base for 1968	178,388,000	38,459,000	18,151,000	234,998,000
Budget Estimate, 1968	186,238,000	40,032,000	18,251,000	244,521,000
Increase	+7,850,000	+1,573,000	+100,000	+9,523,000

a/ In addition, \$700,000 is available by transfer from Cooperative Range Improvements.

SUMMARY OF INCREASES AND DECREASES

	1967 Available	1968 Estimate	Increase or Decrease
<u>Forest Land Management:</u>			
Prepare and sell 280 million board feet and administer harvest of 210 million board feet of commercial thinnings and salvage material ...	\$34,463,000	\$35,900,000	+\$1,437,000
Upgrade present waste treatment systems at 25 recreation sites for water pollution control purposes, develop recreation facilities at National Recreation Areas, and step-up operation, maintenance, and cleanup of existing recreation sites and their facilities	31,139,000	34,528,000	+3,389,000
Accelerate classification surveys of defined subareas in National Forests and National Grasslands; accelerate examination, appraisal, and evaluation of offered and selected lands in exchange proposals; shorten time required in land lines work and conversion to new status records system; accelerate photogrammetric surveys to provide terrain data, resource inventory data, and general management maps for multiple use management in problem areas	5,725,000	6,349,000	+624,000

Forest Land Management: (continued)

Provide better fire protection in line with increasing land and resource values, and more nearly assure standard of protection adequate for successful management of National Forest resources

Additional payments to Employees' Compensation Fund

Help meet National Forest System management and development needs resulting from water development projects proposed and constructed by other agencies

All other

Total, Forest Land Management

Forest Research:

Accelerate forest genetics research to develop high-quality, pest-resistant types of conifers, preferred species of hardwoods, and Southern pine

To supply a stronger technical basis for management of National Forest watersheds and similar water-producing mountain lands

Strengthen research on ecology, protection, and management of areas and measurement of recreation use and trends

Intensify research on electronic fire detection system and new fire control technology to reduce forest fire losses

Strengthen research on bark beetles and defoliators

Speed-up research to develop biological control organisms and genetic host resistance for major diseases of trees and strengthen research to develop more effective preventive and control measures for disease killing and injuring trees

	1967 Available	1968 Estimate	Increase or Decrease
	25,487,000	25,967,000	+480,000
	733,000	759,000	+26,000
	6,766,000	8,660,000	+1,894,000
	<u>74,075,000</u>	<u>74,075,000</u>	- -
	<u>178,388,000</u>	<u>186,238,000</u>	<u>+7,850,000</u>
	8,377,000	8,937,000	+560,000
	3,439,000	3,650,000	+211,000
	479,000	811,000	+332,000
	2,912,000	3,112,000	+200,000
	3,998,000	4,103,000	+105,000
	2,171,000	2,358,000	+187,000

Forest Research: (continued)

	<u>1967</u> <u>Available</u>	<u>1968</u> <u>Estimate</u>	<u>Increase or</u> <u>Decrease</u>
To hasten solution of critical utilization problems, including expansion and acceleration of wood fiber products and related chemical research	6,493,000	6,863,000	+370,000
Expand and accelerate research on aerial logging systems, fully mechanized production line pulpwood harvesting systems to meet increased productivity requirements, and harvesting equipment, machines and tools to meet needs of small timberland operators	583,000	798,000	+215,000
Accelerate timber inventories, provide more local information on industrial development opportunities, and strengthen appraisals of timber supply and demand	2,100,000	2,203,000	+103,000
Evaluate costs and benefits of forestry investments, evaluate effectiveness of forestry programs for small forest owners, and develop principles and guides for planning multiple use management of forest resources	791,000	1,088,000	+297,000
Reduction for nonrecurring forest research construction projects	3,285,000	2,278,000	-1,007,000
All other	<u>3,831,000</u>	<u>3,831,000</u>	<u>- -</u>
Total, Forest Research	<u>38,459,000</u>	<u>40,032,000</u>	<u>+1,573,000</u>
<u>State and Private Forestry Cooperation:</u>			
To provide professional services for increasing hardwood lumber output	1,471,000	1,571,000	+100,000
All other	<u>16,680,000</u>	<u>16,680,000</u>	<u>- -</u>
Total, State and Private Forestry Cooperation	<u>18,151,000</u>	<u>18,251,000</u>	<u>+100,000</u>
TOTAL, Forest Protection and Utilization	<u>234,998,000</u>	<u>244,521,000</u>	<u>+9,523,000</u>

PROJECT STATEMENT

Page: No.:	Project	1966	1967 Estimate	1968 Estimate	Increase or Decrease
:	FOREST LAND MANAGEMENT:	:	:	:	:
:	National Forest protection and management:	:	:	:	:
:	(1) Timber resource management:	:	:	:	:
21 :	(a) Sales administration and management ...	\$31,211,100:	\$34,463,000:	\$35,900,000:	+\$1,437,000
24 :	(b) Reforestation and stand improvement ...	15,901,384:	17,640,000:	17,640,000:	- -
27 :	(2) Recreation-public use	29,095,961:	31,139,000:	34,528,000:	+3,389,000
30 :	(3) Wildlife habitat management	3,507,995:	3,971,000:	3,971,000:	- -
:	(4) Range resource management:	:	:	:	:
32 :	(a) Management	6,199,565:	5,527,000:	5,527,000:	- -
34 :	(b) Revegetation	2,614,527:	2,854,000:	2,854,000:	- -
35 :	(c) Improvements	3,201,209:	3,442,000:	3,442,000:	- -
37 :	(5) Soil and water management	5,479,950:	6,361,000:	6,361,000:	- -
39 :	(6) Mineral claims, leases, and special uses ..	3,859,043:	4,097,000:	4,097,000:	- -
43 :	(7) Land classification, adjustments, and surveys a/	4,996,795:	5,725,000:	6,349,000:	+624,000
51 :	(8) Forest fire protection	22,826,391:	25,487,000:	25,967,000:	+480,000
55 :	(9) Structural improvements for fire and general: purposes (construction and maintenance) ..	12,406,700:	11,040,000:	11,040,000:	- -
59 :	(10) Payments to Employees' Compensation Fund ..	668,586:	733,000:	759,000:	+26,000
:	Subtotal	141,969,206:	152,479,000:	158,435,000:	+5,956,000
:	Amount advanced from "Cooperative Range Improvements"	-700,000:	-700,000:	-700,000:	- -
:	Subtotal, National Forest protection and management	141,269,206:	151,779,000:	157,735,000:	+5,956,000

(continued on next page)

Page: No.:	Project	1966	1967 Estimate	1968 Estimate	Increase or Decrease
	FOREST LAND MANAGEMENT--continued				
60	(11) <u>Water resource development related activities</u>	4,739,039:	6,766,000:	8,660,000:	+1,894,000
64	(12) <u>Fighting forest fires</u>	17,334,130:	b/ 5,000,000:	5,000,000:	- -
66	(13) <u>Insect and disease control:</u> (a) <u>White pine blister rust control c/</u> ... (b) <u>Other pest control d/</u> ...	3,236,704: 7,794,887:	3,687,000: 8,676,000:	3,687,000: 8,676,000:	- - - -
	Subtotal, Insect and disease control ...	11,031,591:	12,363,000:	12,363,000:	- -
71	(14) <u>Acquisition of lands, Weeks Act</u>	678,509:	2,480,000:	2,480,000:	- -
	<u>Total, Forest Land Management</u>e/	175,052,475:	178,388,000:	186,238,000:	+7,850,000
	FOREST RESEARCH:				
	<u>Forest and range management research:</u>				
75	(15) <u>Timber management research</u>	8,034,616:	8,377,000:	8,937,000:	+560,000
78	(16) <u>Watershed management research</u>	3,320,578:	3,439,000:	3,650,000:	+211,000
81	(17) <u>Range management research</u>	1,358,344:	1,294,000:	1,294,000:	- -
84	(18) <u>Wildlife habitat research</u>	800,773:	912,000:	912,000:	- -
86	(19) <u>Forest recreation research</u>	569,230:	479,000:	811,000:	+332,000
	Subtotal, Forest and range management research ..	14,083,541:	14,501,000:	15,604,000:	+1,103,000
	<u>Forest protection research:</u>				
88	(20) <u>Forest fire research</u>	2,655,608:	2,912,000:	3,112,000:	+200,000
90	(21) <u>Forest insect research</u>	3,611,628:	3,998,000:	4,103,000:	+105,000
92	(22) <u>Forest disease research</u>	2,215,467:	2,171,000:	2,358,000:	+187,000
	Subtotal, Forest protection research	8,482,703:	9,081,000:	9,573,000:	+492,000

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Page: No.:	Project	1966	1967 Estimate	1968 Estimate	Increase or Decrease
	FOREST RESEARCH--continued				
	Forest products and engineering research:				
95	(23) Forest products utilization research	5,907,629:	6,493,000:	6,863,000:	+ 370,000
98	(24) Forest engineering research	458,644:	583,000:	798,000:	+ 215,000
	Subtotal, Forest products and engineering research:	6,366,273:	7,076,000:	7,661,000:	+ 585,000
	Forest resource economics research:				
100	(25) Forest survey	1,896,962:	2,100,000:	2,203,000:	+ 103,000
102	(26) Forest products marketing research	1,279,084:	1,625,000:	1,625,000:	- -
104	(27) Forest economics research	673,891:	791,000:	1,088,000:	+ 297,000
	Subtotal, Forest resource economics research	3,849,937:	4,516,000:	4,916,000:	+ 400,000
106	(28) Forest research construction	4,136,346:	3,285,000:	2,278,000:	- 1,007,000
	Total, Forest Research	36,918,800:	38,459,000:	40,032,000:	+ 1,573,000
	STATE AND PRIVATE FORESTRY COOPERATION:				
110	(29) Cooperation in forest fire control	12,825,070:	12,834,000:	12,834,000:	- -
114	(30) Cooperation in forest tree planting	277,884:	300,000:	300,000:	- -
116	(31) Cooperation in forest management and processing	3,478,986:	3,546,000:	3,546,000:	- -
119	(32) General forestry assistance	929,655:	1,471,000:	1,571,000:	+ 100,000
	Total, State and Private Forestry Cooperation e/	17,511,595:	18,151,000:	18,251,000:	+ 100,000

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	1966	1967	1968	Increase
TIMBER RESOURCE MANAGEMENT				
Sales administration and management	\$30,809,000	\$34,463,000	\$35,900,000	+\$1,437,000

An increase of \$1,437,000 is needed primarily to cover the cost of preparing and selling 280 million board feet and administering the harvest of 210 million board feet of commercial thinnings and salvage material.

The total program for fiscal 1968, as compared with 1967, follows:

	1967	1968	Increase or Decrease
		(In thousands)	
<u>Regular program</u>			
Harvest	\$23,955	\$23,950	-\$5
Sale preparation	8,615	8,601	-14
Advance sale preparation	275	305	+30
<u>Thinning and salvage</u>			
Harvest	- -	676	+676
Sale preparation	- -	748	+748
<u>Timber inventories and management plans</u>	1,618	1,620	+2
Total	34,463	35,900	+1,437

Additional workload and cost information for fiscal 1966 through 1968 follows:

	1966	1967	1968
(1) <u>Regular Program</u>			
(a) <u>Harvest</u>			
Million board feet	12,138	12,500	12,500
Cost per thousand board feet	\$1.69	\$1.92	\$1.92
Total cost (in thousands)	\$20,525	\$23,955	\$23,950
(b) <u>Sale Preparation</u>			
Million board feet	11,244	12,000	12,000
Cost per thousand board feet	\$.75	\$.72	\$.72
Total cost (in thousands)	\$8,450	\$8,615	\$8,601

	<u>1966</u>	<u>1967</u>	<u>1968</u>
(c) <u>Advance Sale Preparation</u>			
Million board feet	1,500	2,200	1,500
Cost per thousand board feet	\$.20	\$.13	\$.20
Total cost (in thousands)	\$304	\$275	\$305
(2) <u>Thinning and Salvage</u>			
(a) <u>Harvest</u>			
Million board feet	- -	- -	210
Cost per thousand board feet	- -	- -	\$3.22
Total cost (in thousands)	- -	- -	\$676
(b) <u>Sale Preparation</u>			
Million board feet	- -	- -	280
Cost per thousand board feet	- -	- -	\$2.67
Total cost (in thousands)	- -	- -	\$748
(3) <u>Timber Inventories and Management</u>			
<u>Plans</u>			
Thousands of acres	8,530	9,400	9,500
Cost per acre	\$.18	\$.17	\$.17
Total cost (in thousands)	\$1,530	\$1,618	\$1,620

The proposed program is necessary to meet national needs for timber products including both domestic and defense requirements. Alternate sources of timber cannot provide the necessary increase in volume. Such sources are either being overcut or are producing at or close to capacity. To meet national needs in 1968, a program of expanded thinnings and salvage cutting is needed in addition to the regular harvest cutting. This program is to offer 280 million board feet of thinnings from young overstocked stands and other salvage material. The total harvest program includes the cutting of 210 million board feet of the thinnings and salvage material for a total of 12.71 billion board feet and will cost \$24,626,000, or \$671,000 over fiscal year 1967.

The harvest program requires that 12.28 billion board feet of new sales be offered in 1968. The proposed sale program, including advance sale preparation, will cost \$9,654,000, or \$764,000 over fiscal year 1967.

Returns to the Treasury from the timber harvest program continue to increase. The following tabulation shows receipts from the sale of National Forest timber:

<u>Fiscal Year</u>	<u>Receipts (In millions)</u>
1962	\$106.2
1963	117.4
1964	128.0
1965	138.8
1966	164.9
1967	168.7 (estimated)
1968	171.5 (estimated)

Based on the above tabulation, each dollar of program cost for 1968 will return over \$4.75 to the United States Treasury in the form of receipts.

The program for timber inventories and management plans is at about the same level as in fiscal year 1967, or \$1,620,000 -- up \$2,000 over fiscal year 1967. This work is essential in establishing the allowable annual cut and is basic to the timber harvest program. Working circles are inventoried, and new management plans developed on the basis of current inventory data at about decade intervals. Program costs vary somewhat from year to year based on the size of the working circles involved. Improved techniques have made it possible to keep unit costs nearly constant, despite higher costs.

Examples of Recent Accomplishments

Sales administration. A record high volume was harvested from the National Forests for the fourth consecutive year. During fiscal year 1966, 12.1 billion board feet were harvested -- an increase of 900 million board feet over the previous year. Receipts to the Treasury from this record harvest amounted to \$164.9 million, up \$26.1 million over the preceding year. A total of 11.3 billion board feet of timber was sold on the National Forests in fiscal year 1966. In addition, preliminary award was made in a long term sale of 8.75 billion board feet in Alaska. The contract requires that primary manufacturing of the timber involved will be in Alaska.

Real progress has been made in automating customer accounts in timber sale. It is expected that such accounts on the heavy timber forests in the Western United States will be fully automated during fiscal year 1967.

Progress in meeting the sustained yield allowable cut objectives during the past five years is shown on the following table. A comparison between the volume actually cut and the annual allowable cut is shown below and in Figure 1.

<u>Fiscal Year</u>	<u>Annual Allowable Cut ^{1/}</u>	<u>Actual Volume Cut</u>	<u>Percent of Allowable Cut Harvested</u>	<u>Actual Volume Sold</u>	<u>Percent of Allowable Cut Sold</u>
(Volumes in billions of board feet)					
1962	10.5	9.0	86%	10.3	98%
1963	11.3	10.0	88	12.2	108
1964	12.0	11.0	92	11.7	98
1965	12.0	11.2	93	11.5	96
1966	12.4	12.1	97	11.3	91

^{1/} As of January 1 preceding the fiscal year. Annual allowable cut includes only sawtimber for National Forests west of the Great Plains and in Alaska, and sawtimber and convertible products for National Forests in the eastern half of the United States.

TIMBER RESOURCE MANAGEMENT

COMPARISON OF ANNUAL ALLOWABLE CUT
AND ACTUAL VOLUME HARVESTED 1958 — 1968



Figure 1

	1966	1967	1968	Increase
TIMBER RESOURCE MANAGEMENT				
Reforestation and timber				
stand improvement	\$17,360,000	\$17,640,000	\$17,640,000	- -

No program increase is proposed.

The program for fiscal year 1968 is needed to increase timber growth and quality on the National Forests to supply the Nation's requirements for industrial wood. Other values such as water, wildlife, and natural beauty will also benefit from the work. The supply and demand for timber on which the program is based has been estimated on the basis of gross national product and population projections. They show deficits in timber supply and growing stock by the year 2000 and beyond, at current levels of management. Because of the time required for trees to grow to usable size, a major part of the total needed reforestation and stand improvement work must be done in the next decade to be effective when the timber shortages will occur.

Proposed use of 1968 appropriation and comparison with 1967 and 1966 follows:

	1966 (Actual)		1967 (Est.)		1968 (Est.)	
		Acres		Acres		Acres
Reforestation	\$10,330,000	114,600	\$10,700,000	118,000	\$11,000,000	125,000
Timber stand improvement	5,308,000	187,927	5,525,000	190,000	5,275,000	180,000
Genetic tree improvement	950,000	- -	910,000	- -	1,010,000	- -
Nursery development	772,000	- -	505,000	- -	355,000	- -
Total	17,360,000	302,527	17,640,000	308,000	17,640,000	305,000

The following summary is for the total 1968 reforestation and timber stand improvement program. Projections of timber growth and timber values are based on data obtained by economic analysis.

Increased timber production which will be realized from reforestation of 125,000 acres in 1968:

	Year 2000	Year 2020	Year 2040
Volume (thousands of board feet)	2,438,070	3,961,935	5,485,731
Value	\$47,973,798	\$110,936,364	\$189,896,730

Increased timber production from 180,000 acres of timber stand improvement in 1968:

	<u>Year</u> <u>2000</u>	<u>Year</u> <u>2020</u>	<u>Year</u> <u>2040</u>
Volume (thousands of board feet)	1,626,532	2,643,110	- -
Value	\$39,329,552	\$80,271,238	- -

The \$355,000 for nursery development is for enlargement and modernization of existing nurseries. Replacement of old buildings is still needed at some of the nurseries that were constructed under the CCC program. The major development work is tapering off and should be completed in the next two or three years. The \$150,000 reduction in nursery development below 1967 expenditures will be used for genetic tree improvement and to reforest 600 acres of timber productivity sites 1 and 2 in important commercial timber types.

The genetic tree improvement program is for the purpose of producing improved tree seed in seed orchards for project reforestation work. Results obtained with small quantities of seed already produced in seed orchards and by research projects show marked improvement in disease resistance of white pine, increased gum yields in slash pine and increased growth and quality of other species including the southern pines, Douglas-fir, and ponderosa pine. Orchards are also being established for other important tree species including black walnut and black cherry.

Examples of Recent Accomplishments

Reforestation. An area of 114,600 acres of National Forest land was reforested with appropriated funds in 1966 -- 95,033 acres by planting and 19,567 acres by seeding.

In addition, 10,979 acres were reforested by cultivating the ground to regenerate from natural seed fall.

Other reforestation accomplishments include:

- (1) Procurement of 87,003 pounds of clean tree seed. 41,329 pounds were purchased from commercial seed dealers, and 45,674 pounds were processed in Forest Service seed extractories.
- (2) Production of 99 million trees in 14 Forest Service nurseries.
- (3) Major modernization and expansion at two Forest Service nurseries and minor improvements at eight others.
- (4) Progress on genetic improvement of forest trees consisting of locating superior trees and propagating them in seed orchards and development work to enlarge and improve seed orchards and seed production areas at 160 locations. Production of improved seed for important hardwood timber trees was started with work on black cherry and black walnut.

In addition to reforestation accomplished with appropriated funds, the following work was done with funds collected under authority of the Knutson-Vandenberg Act:

	<u>Acres</u>
Reforested by tree planting	100,867
Reforested by seeding	19,652
Reforested by cultivating the ground to regenerate from natural seed fall	<u>40,112</u>
Total	160,631

The total area of National Forest land reforested in 1966 with appropriated funds and Knutson-Vandenberg funds by planting, seeding, and natural regeneration on prepared sites in 1966 is 286,210 acres. This exceeds last year's record by 27,396 acres.

An estimated area of 118,000 acres will be reforested by planting and seeding with appropriated funds in fiscal year 1967. Planting and seeding with Knutson-Vandenberg funds in 1967 is expected to be 150,000 acres.

Timber stand improvement. An area of 187,927 acres of young growth was treated by the following cultural measures with appropriated funds in 1966 to increase timber growth and improve timber quality:

	<u>Acres</u>
Thinning	69,218
Release	114,136
Pruning	4,573

An additional area of 68,812 acres was lightly burned over by controlled fires in the southern pine types to increase timber growth and timber quality by reducing competition of understory brush and destroying host plants for tree diseases.

Timber stand improvement work was also done for the same purposes with Knutson-Vandenberg funds on the following acreages in 1966:

	<u>Acres</u>
Thinning	76,600
Release	152,946
Pruning	5,194

In addition, 82,623 acres in the southern pine types were treated by controlled burning with Knutson-Vandenberg funds.

An estimated area of 190,000 acres will be treated by stand improvement measures (exclusive of controlled burning) with appropriated funds and an estimated area of 260,000 acres with Knutson-Vandenberg funds in fiscal year 1967.

:	:	:	:	:	:
:	1966	1967	1968	Increase	:
:	:	:	:	:	:
:RECREATION-PUBLIC USE ..	\$28,604,000:	\$31,139,000:	\$34,528,000:	+\$3,389,000:	:
:	:	:	:	:	:

An increase of \$3,389,000 is needed as follows:

- (1) \$1,951,000 for upgrading waste treatment systems at 25 recreation sites for purposes of water pollution abatement in response to Executive Order 11258 dated November 17, 1965.
- (2) \$1,438,000 for development of recreation facilities at National Recreation Areas and similar sites and for stepping up operation, maintenance, and cleanup of the existing 9,500 recreation sites and their facilities.

The following tabulation shows by major program segments total planned financing for fiscal year 1968 as compared with fiscal years 1966 and 1967 (in thousands of dollars):

<u>Operation and maintenance</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>Changes between 1967 and 1968</u>
Cleanup of undeveloped sites	- -	\$308	\$1,250	+\$942
Cleanup of developed sites	\$8,708	9,580	10,849	+1,269
Maintenance of developed sites ...	7,861	8,725	10,077	+1,352
Administration of wilderness	- -	604	1,000	+396
<u>Development</u>				
New construction and quality improvement of existing facilities	<u>12,035</u>	<u>11,922</u>	<u>11,352</u>	<u>-570</u>
Program total	28,604	31,139	34,528	+3,389

As indicated above, a decrease is made in the development item to provide for adequate operation and maintenance of existing facilities. Steadily increasing use of such facilities places serious soil and vegetation impacts at both developed and undeveloped sites. This heavy use requires more intensive cleanup, maintenance, and people-control to assure visitors a valuable recreation experience and protect the sites. Amounts shown for development of facilities include projects of national significance, such as National Recreation Areas, Blanchard Springs Caverns in Arkansas, Boundary Waters Canoe Area in Minnesota, and Sylvania Tract in Michigan.

OPERATION AND MAINTENANCE

Cleanup and administer undeveloped areas, roadsides, and trails. \$1,250,000 will be used to clean up areas of concentrated use on more than 300,000 miles of roads and trails, 90,000 miles of fishing streams, and 30,000 miles of lake and reservoir shores within the National Forests. Concentrated public use at undeveloped areas is a pollution hazard. Shortage of facilities at many developed sites has intensified the problem, especially during holidays and peak weekend periods when overflow crowds are forced to camp and utilize undeveloped areas. Special precautions are essential for public safety and prevention of contamination of water bodies. Measures to provide for public safety by regulation of use at hazardous swimming areas and winter avalanche hazard areas are also a must. More road and trailside cleanup is necessary to maintain acceptable landscapes along travel routes.

Cleanup of developed sites. \$10,849,000 will be used to more adequately finance an acceptable cleanup job. People are demanding higher sanitation and cleanliness standards. Because of increasing use at all developed areas, many even beyond their planned capacity, it was necessary last fiscal year to use recreation funds badly needed elsewhere to accomplish the cleanup job. There are about 9,500 developed sites requiring an expenditure of approximately \$1,150 annually to clean up each site. These sites will accommodate 626,500 persons at one time.

Maintenance of developed sites. \$10,077,000 will be used to protect and maintain all types of recreation facilities at developed sites and information centers in a safe and usable condition. Continually increasing use is putting exceptional wear and tear on improvements and the sites on which they are located. Soil, vegetation, and the "hardware" at many sites demand increased maintenance.

Administration of National Forest wilderness and primitive areas. \$1,000,000 will be used to administer the National Forest wilderness and primitive areas in order to meet the most pressing needs resulting from increased public awareness and use. Sanitation and cleanup; providing information, maps, and instruction to users; and marking of wilderness boundaries where necessary to assure conformance with the Wilderness Act will all require a substantial increase in management effort. Estimated annual cost of National Forest wilderness management averages over 12¢ per acre per year for 14.5 million acres, or \$1.8 million annually.

DEVELOPMENT

Construction of campgrounds, picnic, swimming, boating, observation sites, and interpretive facilities. \$11,352,000 will be used to develop additional recreation capacity that is desperately needed. The lack of adequate developed site capacity is forcing people to use undeveloped areas and creating major sanitation and public safety problems at such places. The program level indicated will finance development of 295 new sites, with a capacity of 19,368 persons at one time. Including the financing available for water resource related activities, approximately 413 sites will be constructed in fiscal year 1968. If this level is maintained until 1972, there will be 11,152 developed sites with a capacity of 792,900 persons at one time. Based upon needs projected in the National Forest

Recreation Survey, by 1972 26,400 sites with a capacity of 2.5 million persons at one time will be needed (Figure 2). At the beginning of fiscal year 1968 there will be 9,500 such sites. Development funds are also used to raise the standard of existing facilities at sites that are not meeting present day demands. An example of such work planned to be done in 1968 is the upgrading of waste treatment systems at 25 recreation sites for purposes of water pollution abatement.

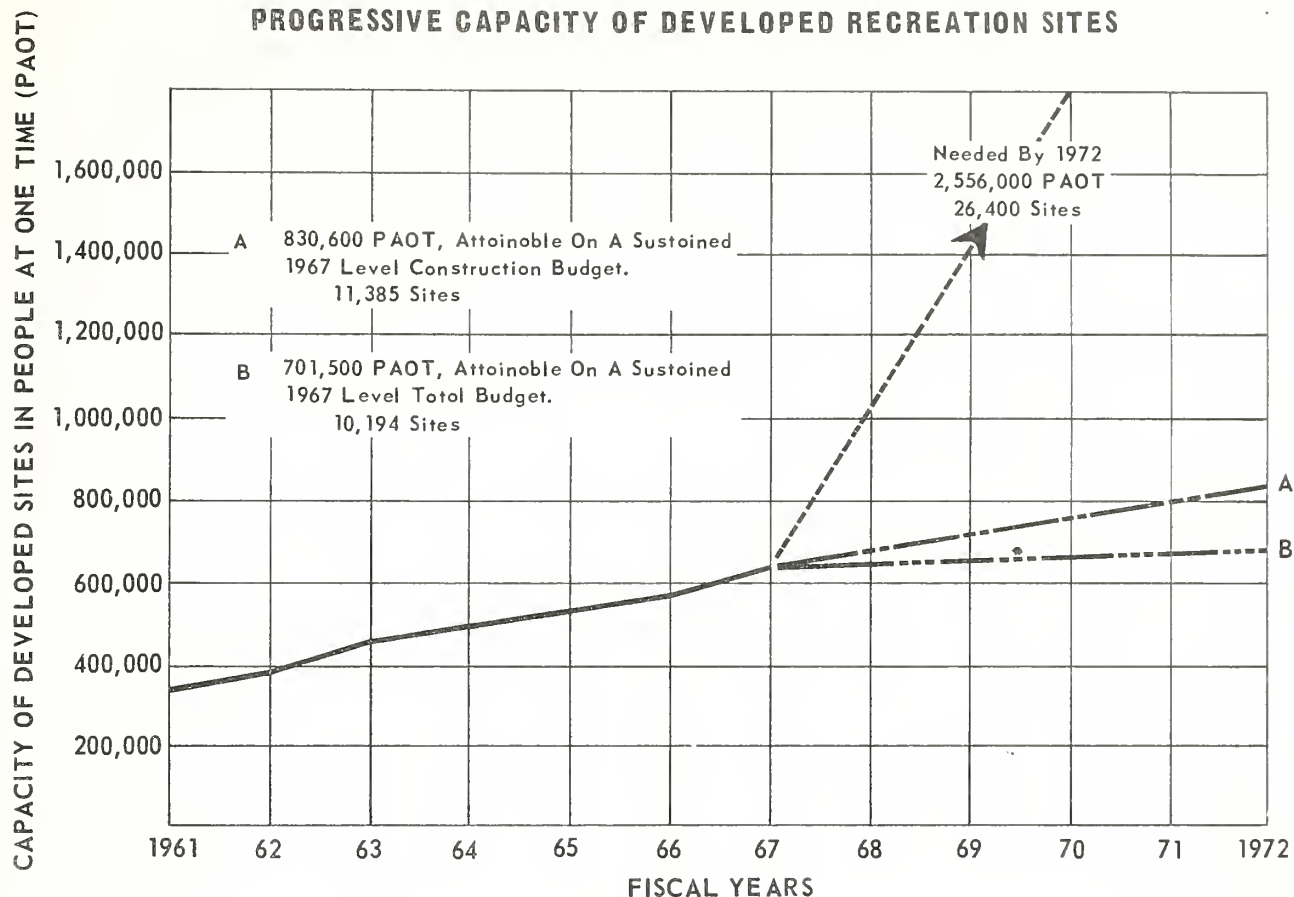
Examples of Recent Accomplishments

Recreation use of the National Forest System reached a new high in calendar year 1965, with an estimated total of 160,336,100 visitor-days being reported. The visitor-day unit is now used by all Federal agencies responsible for administration of recreation use on public lands. Although there is no predictable relationship between these quantities and past estimates which were based on different concepts, evidence indicates that the rate of increasing demand continues unabated.

Camping and picnicking were the most popular activities in 1965 and accounted for 49.5 million visitor-days. Fishing and hunting use totaled 30.3 million and recreation travel (mechanized) was next in popularity with a total of 29.3 million visitor-days. Winter sports of all kinds amounted to 5.4 million visitor-days of which 4.3 million was skiing use. Boating accounted for 4.5 million; swimming, waterskiing and other water sports 4.0 million for a total of 9.5 million visitor-days of water-oriented recreation use other than fishing.

Activities associated with resorts, organization camps, and recreation residences accounted for a record 18.5 million visitor-days.

PROGRESSIVE CAPACITY OF DEVELOPED RECREATION SITES



IMPACT OF RECURRENT WORK ON POSSIBLE EXPANSION OF RECREATION FACILITIES IF APPROPRIATIONS WERE TO REMAIN AT THE 1967 LEVEL

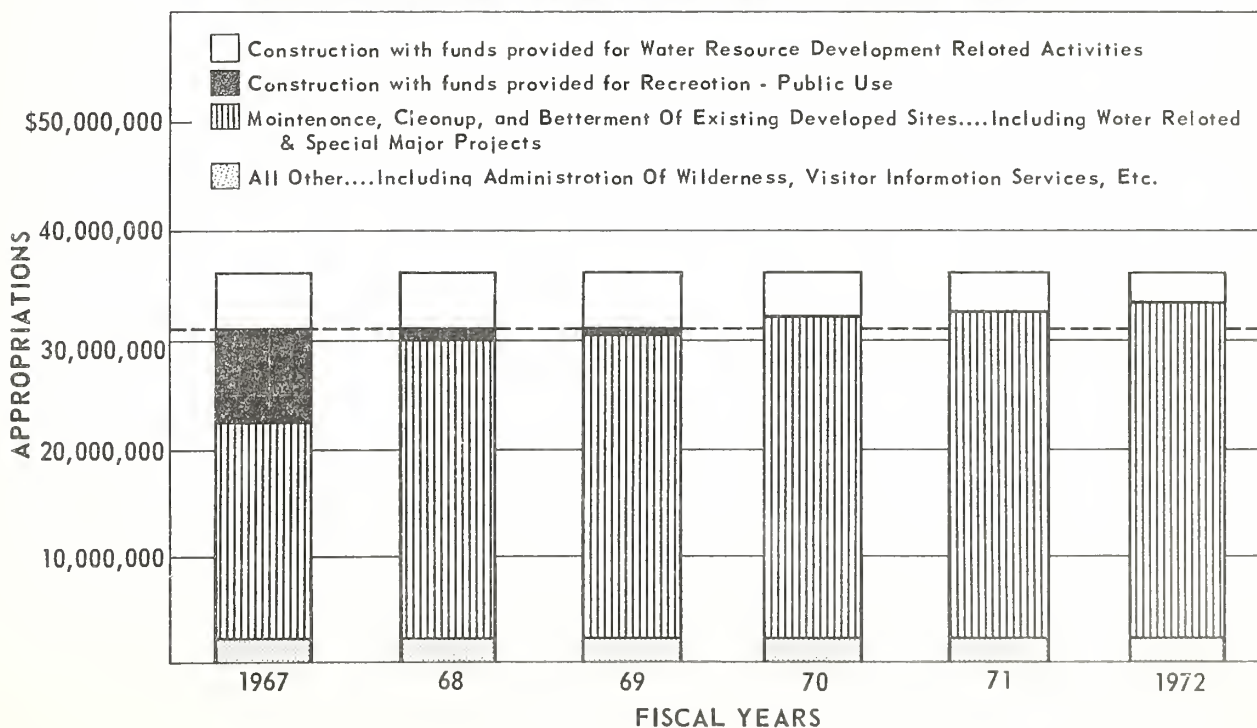


Figure 2

	1966	1967	1968	Increase
WILDLIFE HABITAT MANAGEMENT	\$3,872,000:	\$3,971,000:	\$3,971,000:	- -

No program increase is proposed.

Public demands for fishing and hunting have increased substantially for the past several years as follows:

<u>Year</u>	<u>Millions of Visits to National Forests</u>		<u>Total</u>
	<u>Fishermen</u>	<u>Hunters</u>	
1950	3.2	2.0	5.2
1955	7.6	3.7	11.3
1960	13.3	6.8	20.1
1965	19.4	10.8	30.2

This rate of increase is expected to continue. Fishermen and hunters account for about 25% of the total recreation visits to these public lands. The enjoyment of all kinds of wildlife, including rare and endangered and other nongame forms, is important to many of the additional users. An estimated 50 million man-hours of employment is generated annually in rural areas as a result of hunting and fishing on National Forests.

To accommodate this increasing public need, a progressive wildlife program must be maintained involving the following classes of activity:

- (1) Providing qualified technical supervision over wildlife and its habitat to prevent damage from other resource activities.
- (2) Participating with the respective States in cooperative management and development programs. States are recognized to have regulatory authority over resident species of fish and game which necessitates a cooperative approach. About 40% of the wildlife development work on National Forests is financed by the respective States under cooperative work agreements.
- (3) Improving wildlife habitat through direct project work to increase wildlife production and hunting and fishing opportunities.

Nearly all resource activities on the National Forests have direct effects on wildlife habitat. For example, timber harvesting, livestock grazing, and road building can be very damaging to wildlife unless special precautions are prescribed and followed in implementing management plans for these resources. The coordination of wildlife with other resource uses is one of the major demands on the time of wildlife specialists in the Forest Service organization. Unless this phase of the job is effective damage to wildlife can far exceed the benefits from direct habitat improvement projects.

Habitat for fish, game birds and animals, and nongame species, including rare and endangered forms can be improved to increase productive capacity. The recently completed wetlands development plan for the Chippewa National Forest in Minnesota shows the substantial wildlife benefits which will accrue on one National Forest from a modest investment.

The National Grasslands have great potential for increasing wildlife production for the enjoyment of people. To date, little has been done for wildlife on these lands except in a few localities. Rare and endangered species occurring on National Grasslands include lesser and greater prairie chickens and black-footed ferrets. Various upland game birds, waterfowl, antelope, and deer are the principal huntable game populations occurring here.

	1966	1967	1968	Increase
RANGE RESOURCE MANAGEMENT ..	\$5,362,000	\$5,527,000	\$5,527,000	- -

No program increase is proposed.

Program Objectives

The immediate objective of the range management program is to help meet the current demands of the American public by providing grazing for food and fibre producing animals and for horses and mules used by recreationists. A corollary objective is to improve the rangelands of the National Forest System to economically feasible levels of production and maintain those levels under good management and conservation practices. Along with this is the objective to provide a continued and necessary source of livestock grazing for the 20,000 family-size ranch units which depend in whole or in part on the National Forest System range resource. The Nation is dependent on such free enterprises as these range livestock ranches to meet the expanding demand for food. Ranchers grazing livestock upon National Forest System lands produce fat lambs and stocker and feeder cattle which grow out on these lands and then are moved to grain-producing areas for finishing.

A far reaching objective of this program is to provide a practical demonstration of applied range management science under a wide variety of conditions and thereby favorably influence the management of 600 million acres of privately owned rangeland in the United States.

Even more far reaching is the objective to provide leadership in the management of the world's natural rangelands through practical demonstration and assistance in training of Nationals from countries with range based economies. Our work under this helps meet the Nation's commitments under such international programs as "Food for Freedom" and the "Alliance for Progress." Second perhaps only to staple grains, meat is more in demand than any other item of food in an underfed world.

Program Goals (Figure 4a, top)

The goal is to attain optimum productivity of the range resource on National Forest System lands by the year 2000. Interim goals are:

- (1) To complete a range analysis and develop a plan of management for each of the 11,600 range allotments in the National Forest System by 1972; the average allotment contains 9,000 acres. Analysis is a project job. After the initial job of range analysis and planning is accomplished, funding needs and effort will settle down to what is required to periodically maintain management information current and to update the allotment management plans.

- (2) To have all 11,600 allotments under intensive management by 1973. This jobload and the cost of doing it are cumulative. When an additional 1,000 allotments are placed under intensive management, a new program level is established. To maintain the new program level requires sustained funding commensurate with the new need. If more allotments are placed under intensive management, additional funding is required. For this reason, intensive systems of management are expected to be initiated on only a nominal number of allotments in 1968 (see below). The effort will be directed at providing adequate management to the 4,000 or so allotments which have been placed under intensive management in previous years. The 7,600 remaining allotments will receive only extensive management.

Examples of Recent and Projected Accomplishments

Management of Ranges National Forest System Lands			
<u>Item</u>	<u>1966</u>	<u>Estimated 1967</u>	<u>Estimated 1968</u>
Allotments analyzed (allotment units)	605	607	607
Additional allotments placed under intensive management	1,000	1,000	100
Allotments established in the South .	80	100	120
Number of livestock placed under permit in the South <u>1/</u>	6,260	8,000	10,000

1/ Also in the South, trespassing livestock have been reduced by 20,000 cattle and horses and 8,500 sheep since 1960.

Program Benefits

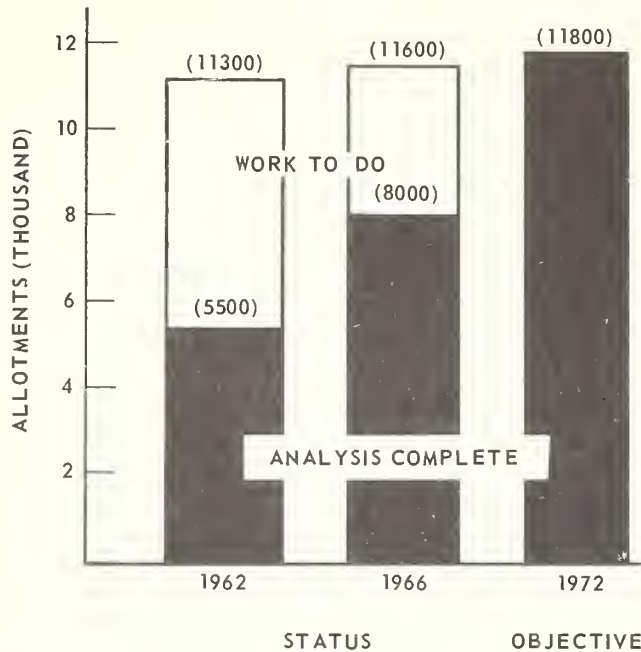
- (1) The 11.1 million animal unit months of grazing provided by the National Forest and National Grassland program produce food and fibre with a gross estimated value of \$75,000,000 annually (Figure 4a, bottom right).
- (2) The 20,000 family size ranch units which operate on National Forest System ranges provide 30,000 man-years of direct employment annually. Other rural employment is generated by the demand for services and supplies created by these 20,000 enterprises.
- (3) Some 600 rural communities, with livestock raising as their principal, economic base, are dependent in whole or in part upon National Forest System lands for their range resources.
- (4) The private land, improvements, equipment, and livestock connected with the 20,000 ranch units which operate on National Forest System lands form a total tax base with an estimated value of over two billion dollars (Figure 4a, bottom left).

RANGE RESOURCE MANAGEMENT

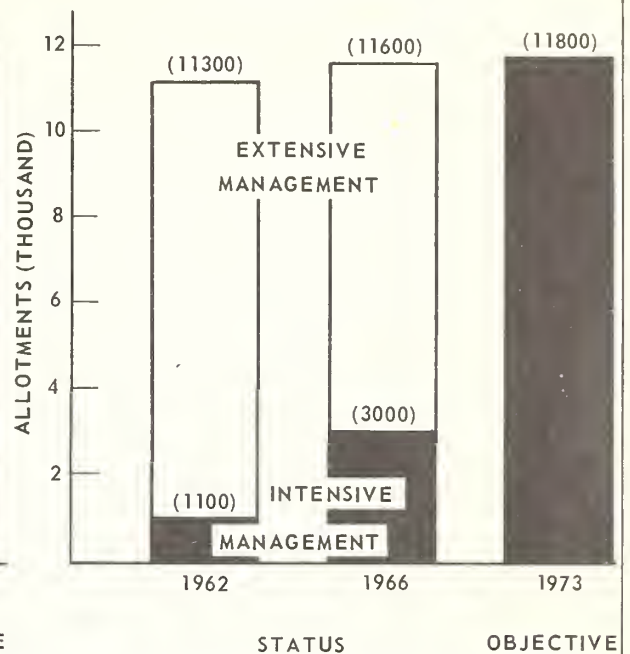
Program Goals and Accomplishments - Management

Range Allotments are analyzed; then put under intensive management

RANGE ANALYSIS

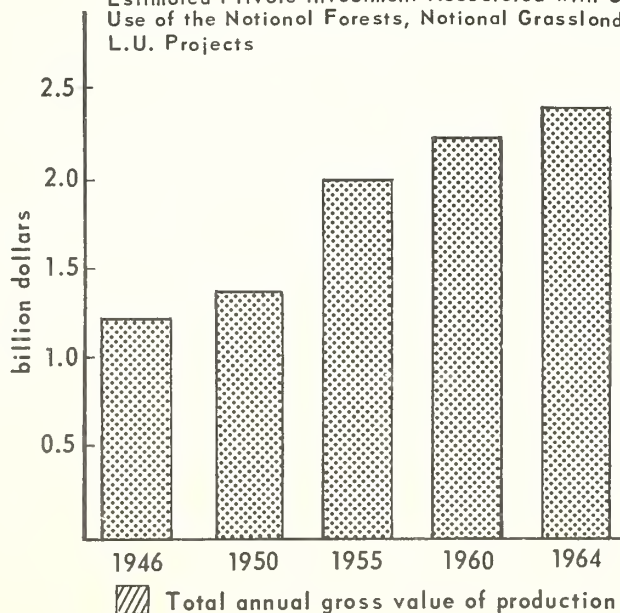


INTENSIVE MANAGEMENT

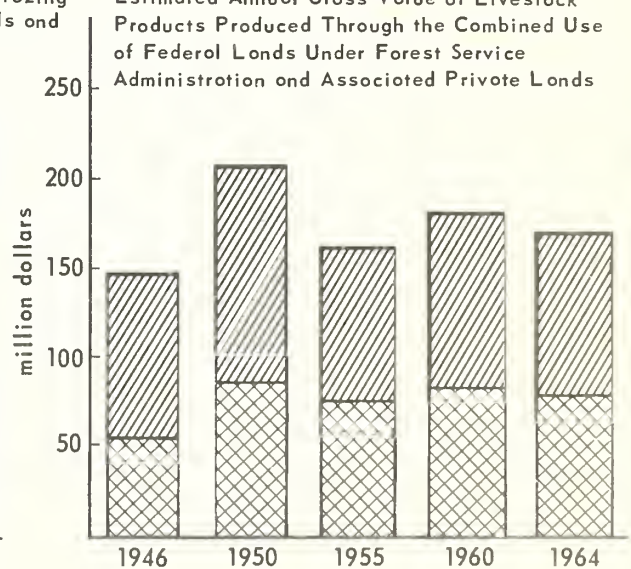


ESTIMATED INVESTMENT IN PRIVATE LAND AND LIVESTOCK, AND VALUE OF LIVESTOCK PRODUCTION ASSOCIATED WITH GRAZING USE OF LANDS ADMINISTERED BY THE FOREST SERVICE

Estimated Private Investment Associated with Grazing Use of the National Forests, National Grasslands and L.U. Projects



Estimated Annual Gross Value of Livestock Products Produced Through the Combined Use of Federal Lands Under Forest Service Administration and Associated Private Lands



Total annual gross value of production
 Annual gross value of livestock products on Federal lands

	:	:	:	:	:
	:	1966	:	1967	:
	:	:	:	1968	:
	:	:	:	:	Increase
RANGE IMPROVEMENTS	:	\$3,379,000:	\$3,442,000:	\$3,442,000:	- -
	:	:	:	:	:

No program increase is proposed.

Program Benefits

Grass has forage value only when drinking water for livestock is near. Many areas of National Forest System range are inadequately watered. Water developments are needed; one development can increase the grazing capacity of the range by as much as 100 cow months. Water draws livestock to the forage; unused forage becomes available when water is provided. Fences make it possible to rotate grazing use among several areas within an allotment so that each area receives periodic rest. This helps maintain the range in good health and at optimum productive capacity. Continuous heavy grazing on the same area can cause deterioration, not only of the range, but of other resources as well.

Program Needs and Goals

The following are needs for structural range improvements as determined by an inventory completed in fiscal year 1966:

<u>Improvement</u>	<u>Number</u>	<u>Estimated Cost</u>
Fences (miles)	60,000	\$81,500,000
Water developments (each)	37,000	53,300,000
Other (each)	14,000	<u>15,700,000</u>
Total estimated cost		150,500,000

In addition, current maintenance need for existing improvements is \$2,600,000 annually. This will increase to \$5,200,000 annually when all improvements are in place. Current permittee contribution is about 50% of the maintenance and 20% of the construction. Costs of water developments to be installed in the future will be considerably higher per unit than current costs. At present, most of the water developments being put in are simple and relatively inexpensive. However, opportunities for getting water so cheaply will soon be less common. Costs per unit will increase as management intensifies and needs for deep wells and pipelines materialize.

Recent and Projected Accomplishments

	<u>1966</u>		<u>1967</u>		<u>1968</u>	
	<u>Units</u>	<u>Cost (In thousands of dollars)</u>	<u>Units</u>	<u>Cost (In thousands of dollars)</u>	<u>Units</u>	<u>Cost (In thousands of dollars)</u>
<u>Government funds:</u>						
<u>Construction:</u>						
Fences (miles)	1,077	1,522	(Same	1,530	(Same	(Same
Water developments			as		as	as
(each)	1,113	630	1966)	630	1966)	1967)
Corrals (each)	13	13		13		
Stock driveways (miles)	57	13		13		
Cattleguards (each) ...	101	102		102		
<u>Maintenance</u>		<u>1,099</u>		<u>1,154</u>		
Total costs		3,379		3,442		
<u>Permittee contributions:</u>						
<u>Construction:</u>						
Fences (miles)	353	337	(Same	(Same	(Same	(Same
Water developments			as	as	as	as
(each)	414	168	1966)	1966)	1966)	1966)
Corrals (each)	30	19				
Stock driveways (miles)	38	7				
Cattleguards (each) ...	23	21				
<u>Maintenance</u>		<u>1,000</u>				
Total costs		1,552				

- (4) Barometer watersheds. Three additional watersheds will be equipped for inclusion in the system of barometer watersheds, bringing the total to 17. These barometer watersheds, carefully selected to be representative of their hydrologic province, are instrumented to measure all the factors influencing the production of a sustained water supply, including the effects of management programs within the watershed on water quantity and quality. The measured findings from the barometer system will provide the factual data needed to accurately prescribe treatment programs in the other watersheds within the same hydrologic province.
- (5) Coordination and protection prescription. It is estimated that detailed prescriptions will be developed by soil and watershed scientists for over 400 development projects. Time has proven these prevention efforts to be most valuable in minimizing soil erosion, stream sedimentation, and other forms of water pollution -- thus preventing a corresponding decline in aesthetic values and in deterioration of water quality with its adverse effect on downstream users. Paralleling these benefits is the reduction in maintenance costs for the development facility. Planned fiscal year 1968 efforts are expected to benefit the water yielding capacity of over one million acres of National Forest System lands.
- (6) Watershed restoration. Watershed restoration projects, based upon complete watershed plans, will be completed on 15 watersheds to prevent further site deterioration, water quality impairment, and in some cases downstream flood damage.

	1966	1967	1968	Increase
MINERAL CLAIMS, LEASES, AND SPECIAL USES	\$3,976,000	\$4,097,000	\$4,097,000	- -

No program increase is proposed.

This program provides for supervision, administration, regulation, and control of mineral disposal and special land uses on National Forest System lands, while ensuring adequate protection of water quality and other surface resources.

The work involves:

- (1) Mineral examination of mining claims included in patent applications.
- (2) Determination of surface rights.
- (3) Mining claim occupancy and occupancy trespass action.
- (4) Mineral leasing and permits.
- (5) Mineral reservation and outstanding rights administration.
- (6) Special uses other than recreation.

Orderly development and disposal of minerals requires careful supervision to protect other forest resources from unnecessary damage during mining operations and to make sure disturbed areas are placed in condition to contribute to sustained beneficial use and production.

Mineral examination of claims under patent application is necessarily on a current basis. Valid mining claims must be recognized and clear-listed for patent when all requirements of the mining laws have been met. Equally important is the detection and elimination of unauthorized use of public land on claims which fail to meet the requirements of the mining laws. This is necessary to release this land for the public uses for which National Forest System lands are managed. It is estimated there are 8,000 occupancy trespass cases on mining claims. Examination under PL 84-167 revealed over 5,300 residential-type structures on mining claims. Actions clearing up less than 1,000 of these cases have been completed. Applications under the Church-Johnson Act will legalize some of these occupancy cases.

Prospecting in wilderness areas can be expected to increase as mining companies attempt to complete their mineral exploration work prior to the 1983 terminal date established in the Wilderness Act. Orderly and supervised exploration, now necessary for coordination with public values of soil, water, and other surface resources, will be even more essential and demanding when assuring harmonization with wilderness concepts.

Mineral leasing activities require similar managerial measures. This includes reviewing applications for mineral permits and leases filed with the Bureau of Land Management to determine whether mineral exploration and development can be carried on in harmony with National Forest objectives to protect soil and water, recreation, and other purposes, and to provide stipulations and guidelines for assuring coordination with surface resource requirements. It includes on-the-ground administration to make sure the stipulations are understood and applied in harmony with other surface use and management, and to make sure that facilities which are a part of mineral permits and leases, such as roads and pipelines, are properly installed and maintained.

Surface mining requires protection and supervision before, during, and after the operation to prevent deleterious effects and provide adequate reclamation. Surface mining of coal has an added hazard of acid pollution of streams. Recent expansion of steam generating capacity using coal will give new impetus to the coal strip mining industry, which has been on the increase each year. Several large surface coal mines have been opened in the West -- notable in the Craig-Steamboat Springs area in Colorado and the Four Corners area of Colorado, New Mexico, Arizona, and Utah. Other operations are taking place in Wyoming. Some of these operations will include coal deposits in the National Forests and Grasslands. New methods of processing and upgrading iron ore and taconite have now made it economically feasible to mine low-grade deposits. Demands for both coal and iron have resulted in increased leasing and mining of both public and privately owned minerals on acquired lands as well as public domain National Forest System lands.

Mineral reservations and outstanding rights administration concern the protection of the public's interest in the surface and future interest in mineral rights and resolving questions of present mineral ownership and surface use rights. Because of the increasing interest in mineral activity on acquired lands, knowledge of mineral ownership will ultimately result in significantly increased revenues to the United States while adding to the economic base of local communities and States. Abstracting of mineral titles was not required with purchase of the land. This program needs to be completed at an early date for all acquired lands within the National Forest System.

Special use permits and easements (other than recreation) for the use of National Forest lands have increased materially within the past few years. In addition, there is a turnover of about 10%, or 4,000 permits, a year caused by changes in ownership. The permits and easements presently being administered cover in excess of 5,000,000 acres and over 57,000 miles of rights-of-way.

Failure to properly supervise and administer these uses could result in serious damage to National Forest resources and a direct monetary loss to the Government. The protection of natural beauty, the health and safety of millions of people, and the control of water and air pollution are all serious factors that must be considered.

Examples of Recent Accomplishments

Mining claims. Determination of surface rights under PL 84-167 begun in 1956 is now about 85% complete. There is remaining, however, on-the-ground examination of nearly 2,300 claims on 22,000,000 acres. As of July 1, 1966, over 114,000,000 acres had been examined. The Government has thus far recognized the validity of 2,033 claims, amounting to 50,000 acres. About 1,000 claims are yet to be examined to complete the complex and difficult task. The following table shows progress for two years and the estimated accomplishments for fiscal years 1967 and 1968:

<u>Year</u>	<u>Acres Examined</u>	<u>Claims Examined</u>	<u>Asserted Rights Valid</u>	
			<u>Claims</u>	<u>Acres*</u>
1965	6,636,900	1,246	147	2,940
1966	4,795,600	1,169	111	2,220
1967 est.	6,000,000	1,200	130	2,600
1968 est.	6,000,000	1,200	130	2,600

* Computed using 20 acres per claim.

Petitions filed under PL 87-851 (Church-Johnson) as of January 1, 1966, resulted in the examination to determine the validity of 164 mining claims on 40 forests. Of 154 applications filed, there were 83 qualified applicants and 40 unqualified. The Bureau of Land Management rejected 31 applications. Fee simple title was offered in 15 cases, 30 were offered life estate, and one was limited to a specific number of years. A total of 60 cases have been consummated under the Act.

Mineral permits and leases. There are over 17,000 mineral leases and permits on 15 million acres within the National Forest System. Mining and prospecting permits issued and administered by the Forest Service directly during fiscal year 1967 covered nearly three-fourths million acres. Included were some 1,040 permits for common varieties of mineral materials and nearly 1,100 permits for borrow pits for highways and construction purposes. Total revenues from mineral leasing and oil and gas exploration and development on National Forest System acquired lands and common variety sales from all National Forest System lands, amounted to \$3,752,760 for fiscal year 1966. In addition, an estimated \$16 million in revenues were received from rents and royalties for leases on National Forest and National Grasslands reserved from the public domain.

A significant agreement (two leases) was recently negotiated with International Nickel Company to mine copper, nickel, and associated minerals from approximately 5,100 acres in the Superior National Forest, Minnesota. If the initial exploration and development of metallurgical processes proves economically feasible, it will provide an economic boon to the community of Ely and to northern Minnesota, which will suffer with the closing of the Pioneer mine, which is being phased out. Special provisions have been included for the protection of soil, water, and recreation resources, including natural beauty.

In addition to the above, there are 140 active operations on some acquired lands in which the owner retained mineral rights when the land was purchased by the Government.

Special uses. National Forest land and other land administered by the Forest Service may be used for special purposes when such uses are in the public interest. About 40,000 special use permits covering 51 different purposes such as archaeological research, hay cutting, electronic installations, reservoirs, water supplies, and many other desirable uses are now in effect. Fiscal year 1966 receipts for special land uses were:

Power	\$104,073
Other land uses, not associated with recreation	534,745
Total	<u>638,818</u>

This is an increase of \$40,363 over the previous year.

	1966	1967	1968	Increase
LAND CLASSIFICATION, ADJUSTMENTS, AND SURVEYS	\$4,345,000	\$5,725,000	\$6,349,000	+\$624,000

An increase of \$624,000 is needed for the following purposes:

- (1) \$23,000 for land classification.
- (2) \$416,000 for land exchange.
- (3) \$139,000 for land line location and land status records.
- (4) \$46,000 for photogrammetric surveys.

These increases are further explained under each item below:

Land classification. An increase of \$23,000 is needed to:

- (1) Accelerate classification surveys of defined subareas in National Forests and National Grasslands as basis for programing expanding land exchange and land consolidation programs and National Forest boundary adjustments -- taking into account land ownership, management situations, land use, and public values.
- (2) Accelerate cooperative planning efforts at communities in Alaska to facilitate State applications for National Forest lands -- a matter of State and local concern.

The requested increase will bring the total amount available for this activity to \$369,000.

The function of land classification is to make analyses and recommend programs concerning the scope, location and composition of the National Forest System.

Current and prospective growths in population, increased leisure, demands of urban people for outdoor space, crises in water supplies relative to expanding needs, and increased national needs for forest products bring mounting pressures on available land. Land area is fixed; demands constantly increase; these factors give urgency and complexity to National Forest System planning.

Changing public interests require reexamination of the boundaries of National Forest units relative to needs of the public for water, recreation, wood, and living space. Areas where more effective and economical administration of the National Forests for conservation purposes might be achieved by consolidations of landownership through exchange procedures must be defined and critically evaluated. This is necessary to provide a firm basis for planning advantageous land consolidation programs, establishing priorities, and scheduling timing. Areas where transfers between public agencies will promote economy in the management of public properties also must be defined, analyzed, and evaluated.

Additions to the National Forest System are based upon adequate analyses of all factors involved to assure that the public advantages are high and justified permanent National Forest programs. The continuing and growing public use of lands at and near large Federal reservoirs require land jurisdiction and management arrangements that promote optimum public use and efficiency of administration. National Forest programs tie in directly with national programs for improved rural economies, increased forest resources, reduced stream pollution, adequate outdoor space for public use, and enhancement of the scenic values of rural lands.

Consolidation problems that affect public programs in National Forests and National Grasslands will require more consideration and accelerated action as use pressures on land intensify. Interdepartmental agreement on management of land at Department of the Army reservoirs and legislation enacted in 1965 to enable transfer of lands at Bureau of Reclamation projects have stepped up action for consolidation of land jurisdictions at Corps and Bureau reservoir projects located within or adjoining National Forests. Joint studies with the Bureau of Land Management or the National Park Service are underway or completed which concern proposals for substantial adjustments in land jurisdiction. Additional consideration is being given to possible enlargement of National Forest programs in Appalachia. The public interest in other rural areas where forestlands predominate but local economies are at a low ebb needs consideration. Now underway is a survey of the potentials for National Forest programs in the Potomac Basin that would provide effective assistance in the attainment of national objectives for that area.

The land classification program for fiscal year 1968 will be concerned with some 5 million acres of forest, watershed, and recreation lands, largely in the eastern United States but including public domain -- National Forest and National Park-National Forest areas in the western part of the Nation. This concern will be from the standpoints of National Forest land consolidation; National Forest boundary adjustments to exclude lands where National Forest programs are no longer justified and include lands where such programs will be nationally and locally desirable; national recreation area proposals; and interagency adjustments in land management and jurisdiction.

Examples of Recent Accomplishments

Cooperative studies in Montana by the Forest Service and Bureau of Land Management resulted in an interchange of jurisdictions involving nearly 66,000 acres of public lands. Lands transferred to the Bureau consisted of an isolated block of National Forest lands remote from the forest supervisor's and district ranger's offices and surrounded by lands administered by the Bureau of Land Management. Lands transferred to the National Forest System approximated 38,000 acres in scattered tracts of vacant public domain that were distant from other lands administered by the Bureau but adjacent to comparable lands administered by the Forest Service. A similar effort in Colorado brought about consolidations of National Forest and scattered public domain at Dillon Reservoir. This will permit integrated development of public recreation on such lands in the interest of efficient and economical public land management. An intensive analysis of areas in Colorado National Forests wherein private lands stemming from mineral patents and many small intermingled tracts of National Forest lands give rise to difficult management and use problems is well underway to give direction to exchange and consolidation programs.

Land exchange. An increase of \$416,000 will be used to:

- (1) Examine an estimated 150,000 acres of offered and selected lands in highly desirable exchange proposals.
- (2) Prepare appraisals and valuation reports including supplemental studies as necessary for 100,000 acres of offered and selected lands. These are cases already in process which are in urgent need of early completion.

The proposed increase will bring the total amount available for this activity to \$2,908,000.

Overall fiscal year 1968 plans for this program are to implement a 5-year crash program of land exchanges recommended by a Joint Management Review Task Force, comprised of people in the Bureau of the Budget, USDA, and CSC. This effort will enable the Forest Service to update and perfect present land adjustment plans for all areas. It will involve the examination and appraisal of 650,000 acres involving an estimated 475 exchanges. The land the Government gives and receives in exchanges must be examined and appraised.

Properly conceived exchanges can result in obviating the construction of certain road segments, and the locating and marking of property lines. The issuance of certain special use permits and other management costs can also be avoided. Substantial program costs can be avoided as a result of these effects. For example, the estimated 10-year cost avoidance to be achieved with the \$2,908,000 programed for fiscal year 1968 is \$16,200,000 (Figure 7a). Selected examples of estimated savings which will result during the next ten years from the fiscal year 1968 exchange program:

<u>Reductions</u>	<u>Units</u>	<u>Amount</u>
(1) Property lines and corners	4,170 miles	\$4,500,000
(2) Road construction and maintenance ..	540 miles	7,900,000
(3) Use permits and occupancy trespass .	1,180 cases	700,000
(4) Road rights-of-way needs	800 cases	<u>3,100,000</u>
Total		16,200,000

Material revenue increases to the United States Treasury can also result through well planned exchanges. Access road problems can be eliminated and make heretofore inaccessible mature timber stands available for harvest to the mutual benefit of the United States and timber companies in need of log supplies. Significant benefits can be derived for both the United States and private owners engaged in livestock operations through the consolidation of ownerships, thus reducing costs and improving management of the ranges.

An example of a recent exchange approved in the State of Oregon: The United States will grant a heavily timbered 80-acre parcel surrounded by private lands. In return, the United States will acquire six parcels totaling 1,188 acres. 1,111 acres of the land being acquired is good timber-producing land which will increase the allowable cut by approximately 1,000,000 board feet. The exchange will result in a net reduction of 11-3/4 miles of property line and will reduce road right-of-way needs and road construction.

In fiscal year 1966, 127 land exchanges were consummated. In these exchanges the United States acquired 166,150 acres valued at \$16,075,028 and granted 148,631 acres valued at \$15,325,763. The net increase in National Forest acreage was 17,519 acres.

Land line location and land status records. An increase of \$139,000, or a total program of \$2,140,000, is needed to establish funding levels that will shorten the time required to complete the initial phases of these programs, namely:

- (1) Corner search and identification phase in land lines work. At present program levels this phase will require more than 25 years to complete. The increase for 1968 is the first step toward shortening this span to ten years or less.
- (2) Conversion to new status records system. Present program levels will only assure having this project one-half completed by 1970. This is much too short a span and the increase for 1968 will be a start toward the objective of getting the entire project completed by the end of 1972.

The Joint Management Review Task Force recommended that these two projects be drastically stepped up and pushed to completion. The total job is the task of getting land ownership lines defined on the ground by proper corners and clearly marked boundary lines and installing a complete, easily understood ownership record of all lands in the National Forest System including the encumbrances and outstanding rights and interests that limit or restrict management.

This money will have to be spent either in a planwise program or to handle trespass and claims cases that are sure to occur. A general description of each of these programs follows:

Land line location. Lands in the National Forest System are bounded by 281,168 miles of property lines and 1,132,353 property corners. The corners were established by surveyors from 50 to over 150 years ago (average over 100 years ago). A continuing program for finding, marking, and maintaining these corners and lines was started in 1958. Before this, there was no provision for this work. Little was done and many corners have been lost. It is estimated that 10,000 corners disappear yearly. This program needs to be speeded up to meet the demands for development and public use of all National Forest System resources, to prosecute and prevent trespass, and to carry on general administration with full confidence and a minimum of conflicts and ill will.

In fiscal year 1966 \$255,000 of the Forest Service appropriation for land line work was transferred to the Bureau of Land Management to finance part of this program. A similar transfer (\$285,000) was made in fiscal year 1967. This level will be maintained in fiscal year 1968.

Preliminary reports show that the Bureau established 995 corners by cadastral survey on lands administered by the Forest Service during 1966, the first year of this cooperative program. It is estimated that 80% of the established corners are property corners and 20% are corners off National Forest property lines but needed to control the corners on the property lines. This is an outstanding accomplishment considering that the work must be scattered to meet pressing needs.

Work Proposed for 1968 As Compared With 1967 and 1966

Job	: FY 1966 : : Accomplished :	: FY 1967 : : Planned :	: Total : : Planned : : FY 1968 :	: FY 1968 : : Planned : : Increase :
<u>Corners</u>	:	:	:	:
Search	: 22,000 :	: 26,000 :	: 27,000 :	: +1,000 :
Remonument	: 10,500 :	: 11,000 :	: 11,750 :	: +750 :
Establish	:	: 700 :	: 750 :	: +50 :
Maintenance	:	: 200 :	: 400 :	: +200 :
<u>Miles</u>	:	:	:	:
Identify, survey and mark:	:	:	:	:
To full standard	: 1,350 :	: 1,000 :	: 1,050 :	: +50 :
To partial standard	:	: 1,500 :	: 1,600 :	: +100 :
Maintenance	:	: 1,500 :	: 1,625 :	: +125 :

Examples of Accomplishment Since 1958

Corners (1,132,353 in National Forest System)

1. Search for corners:

a. Corners searched	128,560
b. Corners found	69,600
c. Corners lost	59,000

2. Establish and perpetuate corners:

a. Found corners remonumented	57,100
b. Corners established	1,900
c. Monumented corners maintained	500

Property Lines (281,168 miles in National Forest System)

1. Identify, survey, and mark:

- a. To full standard 7,870
- b. To partial standard 23,100

2. Maintain lines previously identified, surveyed, and marked 8,750

Land status records. This is a job of converting to a new status record system. In the process all records affecting title and restricting use of lands in the National Forest System are reviewed. Many discrepancies and previously unknown interests are being found and corrected. The new system will provide current central posting of records and a complete atlas record for all Forest Service administrative field units (about 1,100).

Work Proposed for 1968

	<u>1966 Actual</u>	<u>1967 Planned</u>	<u>1968 Estimated</u>	<u>Increase</u>
Townships completed	1,500	1,700	1,850	+150

(Total townships in program -- 17,000.
Completed through 1966 -- 5,900)

Examples of Program Benefits

The systematic research of records and conversion to the new system continues to identify many parcels and general areas which have previously been misunderstood, identified inaccurately or overlooked in administration due to poor identifying ties between records and ground location. This project goes "hand-in-glove" with the land line location program.

Partial completion of the National Grasslands and Land Utilization projects has revealed several parcels of public domain land previously considered to be private. Major acreage discrepancies continue to be found on several National Forests. Trespasses continue to be revealed.

A major accomplishment is the assembly of many complex mineral ownerships, platted as individual mineral surveys, on base maps to show their proper location with respect to lands of the United States. These for the first time give field people sorely needed details of situations to help in preventing trespass and in solving administrative problems.

Photogrammetric surveys. An increase of \$46,000 is requested to bring the total for this project to \$932,000. There is an urgent need to accelerate photogrammetric surveys to provide terrain data, resource inventory data, and general management maps for multiple use management in problem areas. The increase is proposed to meet the minimum needs of 200 square miles of terrain data.

At the present time our lack of terrain data on land in the National Forest System seriously hinders and restricts multiple use planning and resource management and protection. Many thousands of man-hours are lost because of non-existent, inadequate, or incomplete photographic and terrain information for such functions as designing roads, laying out timber sales, developing recreation areas, and general planning. Moreover, lack of these data prevents the preparation of standard multiple use plans, limits the use of modern terrain data techniques in National Forest management activities, and fosters poor judgments and questionable decisions. Plans have to be remade whenever more adequate data become available, thus further aggravating the situation by duplication of effort and added cost.

Multiple use planning requires a particular knowledge of the terrain, the extent and location of the natural resources, such as timber and range and how these resources are related and tied in with existing and planned transportation and recreational facilities. Elevational information is essential in the planning of transportation systems, timber sales and recreational facilities. Aerial photographs and photogrammetric surveys are the most modern tools for use in procuring data needed to determine the extent and location of National Forest resources, for improving and extending the management of them and related facilities, and for recording multiple use plans and activities.

These data are needed on some 617,000 square miles of area within the National Forests for general planning of transportation systems, and planning timber sales. Approximately 44% of this area is adequately covered. The funds programed for fiscal year 1968 would be used to procure aerial photographs, establish horizontal and vertical control and procure elevational terrain information by photogrammetric methods for 0.5% or an equivalent of 3,200 square miles of the areas for which these data are needed.

The scale, format, and accuracy of this material would be such that it can be released to the U.S. Geological Survey and form an integral part of the standard topographic mapping program of the United States. Thus, duplication of effort is avoided, costs are reduced, and the availability of standard topographic maps is speeded up.

In addition, the funds would be used to prepare, from existing terrain data, bases on the scale and format needed for showing the interrelationship of all National Forest resources--timber, water, forage, fish and wildlife, and recreation--affecting the multiple use management of the National Forest System. The scale and format of the prepared material must be compatible with the scale of the aerial photographs used in the execution of resource inventory surveys. These data are transferred to the multiple use management plans by photogrammetric means. The area of coverage of the plans to be prepared with the requested funds is about 0.5% or 4,000 square miles of the total requirement, or a decrease of 11,000 square miles for which funds were available in fiscal year 1966.

Utilizing the terrain data and resource inventory data procured through photogrammetric procedures, it is proposed to prepare general management bases on an adequate scale and format for approximately 15 National Forests. This represents new bases for approximately 5% of those needed but makes no provision for needed revision to bring others up to date.

The following table, illustrated by Figure 7b, shows comparison of the actual or planned accomplishments under approved or requested financing:

	<u>1966</u>	<u>Fiscal Year</u>	
		<u>1967</u>	<u>1968</u>
Terrain data (square miles)	3,800	3,000	3,200
Resource inventory data (square miles)	15,000	4,000	4,000
General management base (forests)	15	15	15

TRENDS IN FOREST SERVICE LAND EXCHANGES

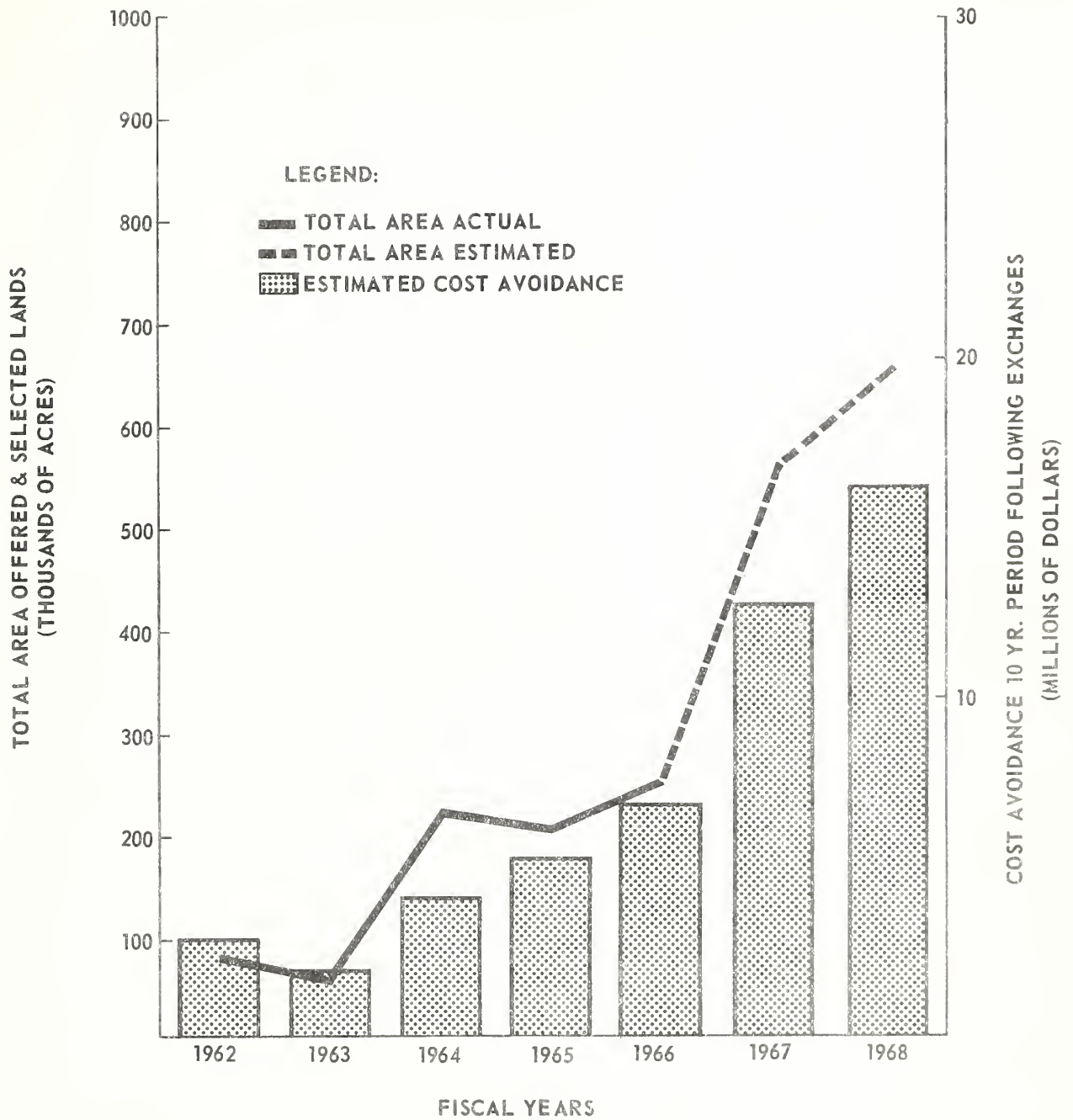


Figure 7-a

PHOTOGRAMMETRIC SURVEYS

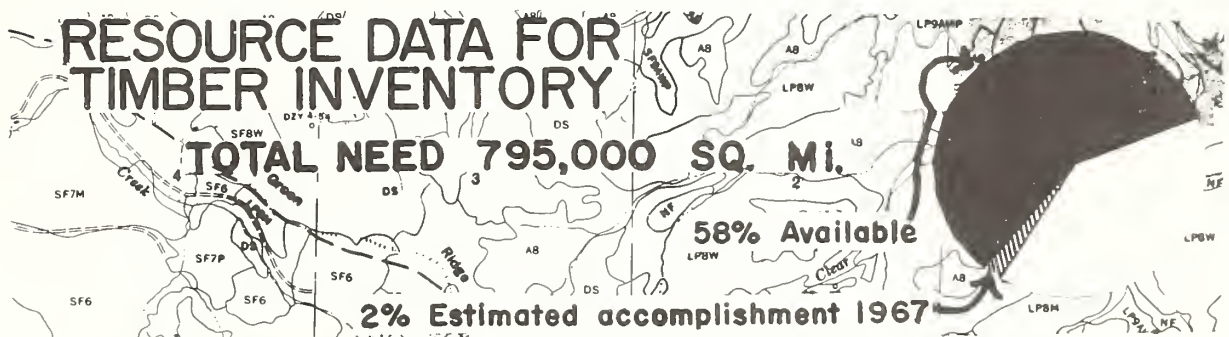
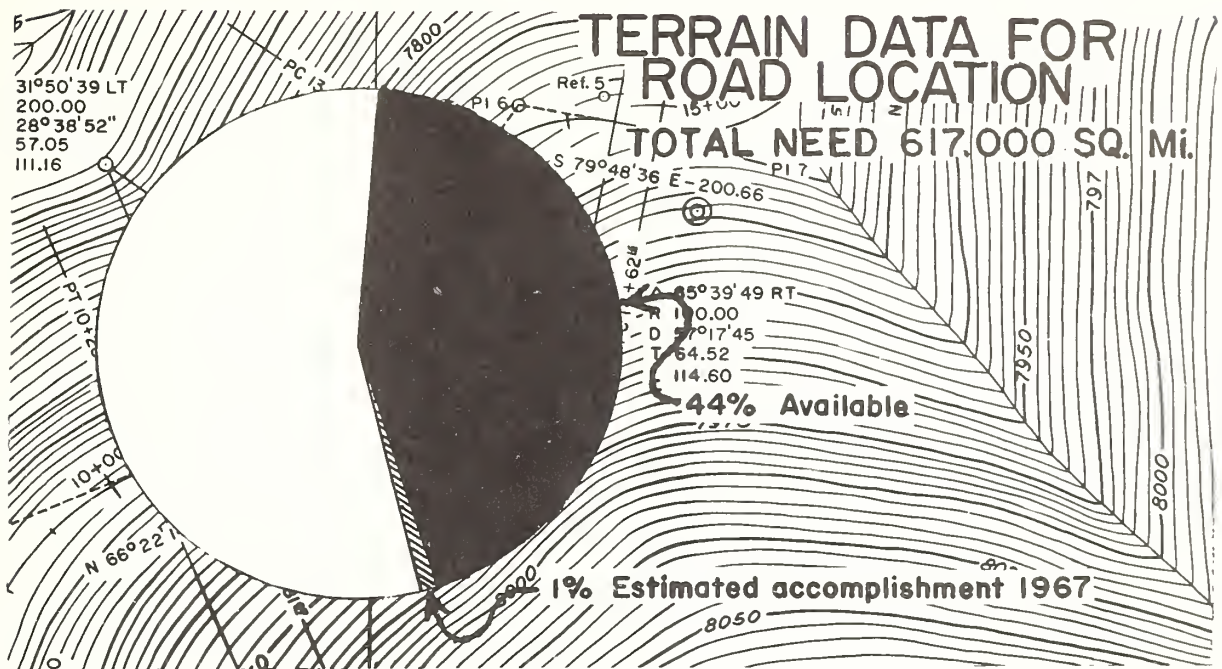


Figure 7-b

	1966	1967	1968	Increase
FOREST FIRE PROTECTION	\$24,454,000	\$25,487,000	\$25,967,000	+\$480,000

An increase of \$480,000 is needed to:

- (1) Provide better fire protection in line with increasing land and resource values.
- (2) More nearly assure a standard of protection adequate for successful management of National Forest resources.

The speed and dependability of fire attack will be increased by strengthening planned initial attack forces to bring them nearer to the level determined to be needed. More rapid back-up support for local forces in those situations where conditions prevent early control will be provided by placing six additional mobile 25-man crews at strategic locations in the western States. The eight existing such crews were used extensively during the 1966 fire season and were instrumental in stopping many medium-sized fires from burning even greater acreage.

Although the trend is generally downward, we are presently unable to hold burned acreage to acceptable limits during severe fire seasons. The 1966 fire season is a specific example. The most serious problem is to develop capability to reduce the number of large fires and keep burned acreage down during bad years.

The following tabulation shows relationship of proposed financing for fiscal year 1968 and that available for fiscal years 1966 and 1967 (in thousands of dollars):

<u>Protection Measures</u>	<u>FY 1966</u>	<u>FY 1967</u>	<u>FY 1968</u>	<u>FY 1968 Increase</u>
Fire prevention	3,490	3,565	3,565	- -
Fire detection	3,310	3,380	3,380	- -
Fire attack forces	13,550	13,862	14,342	+480
Air operations	2,670	3,240	3,240	- -
Fuel modification	310	310	310	- -
Equipment development and testing	610	610	610	- -
Studies, surveys, plans, and training	<u>514</u>	<u>520</u>	<u>520</u>	<u>- -</u>
Totals	24,454	25,487	25,967	+480

Program Objectives

Forest fires cause serious damage to water, soil, timber, recreation, and forage resources. The overall objectives of fire protection are to achieve, at reasonable cost, an acceptable degree of protection from loss by fire of these valuable resources, as well as to protect property and human lives.

Reduction in area burned has been achieved in most years through:

- (1) Increased fire prevention and law enforcement.
- (2) Better training of fire control personnel.
- (3) Expansion of air operations for rapid delivery of firefighting equipment and men and dropping of fire retardants.
- (4) Improved predictions of burning conditions.
- (5) Improved fire equipment and better understanding of fire behavior.

Cooperative efforts with other Federal agencies, States, and municipal fire control organizations have been expanded and strengthened. These efforts have resulted in a more effective overall fire control job.

The specific goals planned for fiscal year 1968 are as follows:

- (1) Accelerate the fire prevention program to reduce man-caused fires to the goal of 3,500 annually by 1970.
- (2) Cut down the heavy losses occasioned by the few but disastrous "conflagration fires" by strengthening forces for more effective initial attack, particularly in the high risk and high hazard areas where these fires occur.
- (3) Continue to improve cooperative efforts with other Federal agencies, States, and municipalities with the objective of developing more available "total strength" when major fire emergencies develop. An interagency fire center at Boise, Idaho, is being developed jointly with the Department of the Interior. Joint planning is being done in fiscal year 1967 with construction funds included in Bureau of Land Management requests for fiscal year 1968.
- (4) Improve fire management through better training of fire control personnel; developing more effective fire equipment; and expanding its operational use.
- (5) Accelerate safety and related efforts to reduce the chances of men being burned while fighting fires.

Examples of Recent Accomplishments

Air attack progress. Night helicopter operations offer great possibilities to get firefighters on the fireline quickly and efficiently when they are most needed. Favorable results from current tests in progress under actual forest fire conditions should provide guidelines for limited night operations in 1967. Many additional heliports and helispots which tie to plans for ground attack have been developed for more efficient and economical firefighting. Additional airplane patrols for detection of forest fires were organized recently.

Fire training and development. Fire training is doing much to assure competent supervision and efficient work in all fire control activities. Completion of fire control training and development guides established new benchmarks for fire training needed by all Forest Service personnel, and by personnel specializing in fire control. Careers in fire work are given more definite direction by the guides. The Fireman's Handbook was revised and reissued. It was written especially for use by non-professional firemen and crew bosses.

The Progressive Referral Method was developed for fire training and first used in 1966. With PRM the trainee is progressively referred to explanatory materials when his knowledge is lacking, or to new subject matter when he finds himself adequate. This new method promises to save much of the cost of linearly programmed texts and of retraining when it is unnecessary.

Other fire training in 1966 included pilot testing of Edex, a response-demanding audio-visual device, and training of 70 Forest Service and cooperating agency personnel in fire generalship. A new training film, "Fire vs. Fire," has been produced to help identify training needs and reasons for using backfiring and burning-out in firefighting.

Fire prevention and law enforcement. Emphasis during the past year has been on preparation for additional public use pressures. This was highlighted by a service-wide staff work conference where a new national action plan was drafted. The plan recognizes both on-the-ground and far-reaching prevention actions taken by home unit fire personnel and resource managers. Emphasis in prevention has been placed on all fire agencies working cooperatively.

Most noteworthy of new day-to-day prevention work has been the use of a helicopter as a prevention tool in a high frequency escape-fire and incendiary area. More attention has been given to spark arrester and inspections to reduce fires from equipment.

Safety. An improved Belt-Kit Fire Shelter has been given initial field distribution. This shelter is carried by the fireman and is for last-chance-only use. It is constructed of better fire-resistant materials and is intended as an extra measure of protection for individuals working in critical conditions.

Through September 30, one firefighter was killed as the result of a rolling rock. Then on November 1, a flareup on the Loop Fire, Angeles National Forest, California, burned to death 10 men and severely injured 12 others. Two of the injured men died in the hospital later. A group of fire experts analyzed this tragedy. In early 1967, a task force will prepare a program for carrying out the analysis group's recommendations to prevent similar disasters.

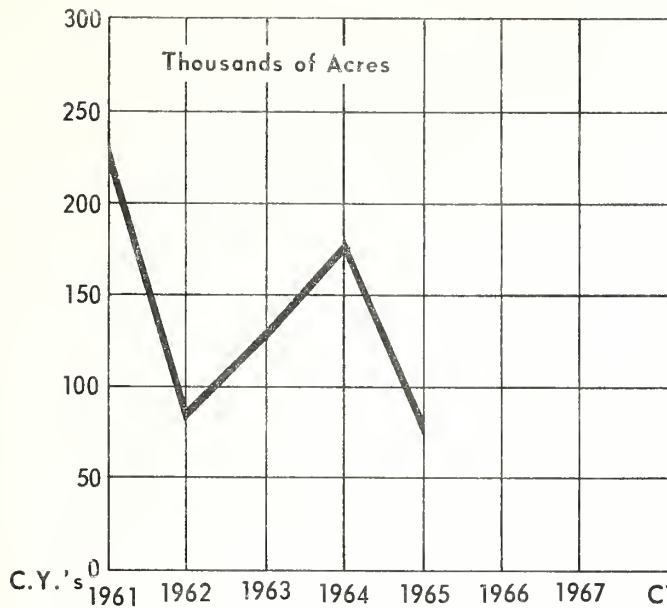
Air safety has been strengthened by improving upon inspection of contract aircraft. Safety-oriented training materials have been prepared which are directed toward helicopter users.

Fire weather and fire-danger rating. Fire-weather reporting and forecasting services have been improved in many areas. Working in close cooperation with the U. S. Weather Bureau, fire managers are supporting field forces with better fire-weather information and forecasts. A new meter for determining fire-danger rating has been developed and is undergoing field tests. Early trials indicate the device will speed up and improve accuracy of fire-danger calculations.

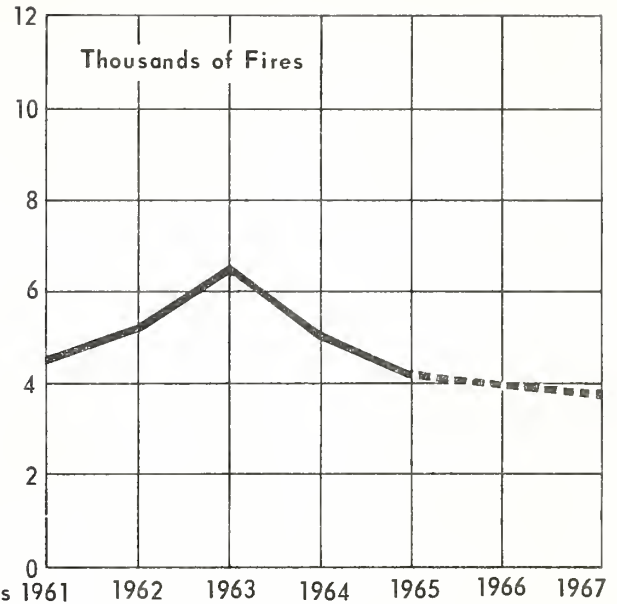
Fuel modification. This work is modest in extent but highly important in providing results for application on a broad scale when an expanded fuel modification program is possible. The work is being integrated in the overall fire planning process to provide, in addition to hazard reduction in heavy fuel concentrations, a preplanned system of firebreaks and accessways that will enhance overall fire control effectiveness and multiple use values.

Rural fire defense. The National Fire Coordination Study made the last two years for the Office of Civil Defense showed that fire will be a serious but manageable threat to human lives if a nuclear attack is launched upon the United States. Using the findings of pertinent research and administrative studies, the comprehensive report of this study describes programs to counter the fire threat and presents guidance materials, plans, methods and equipment with which nationwide preparations for defense from nuclear fire can be started. This report is a "State of the Nation" treatment of the nuclear fire problem. Rural fire defense plans and preparations of the Forest Service are being geared to the findings of this report.

AREA BURNED - NATIONAL FOREST PROTECTION AREA

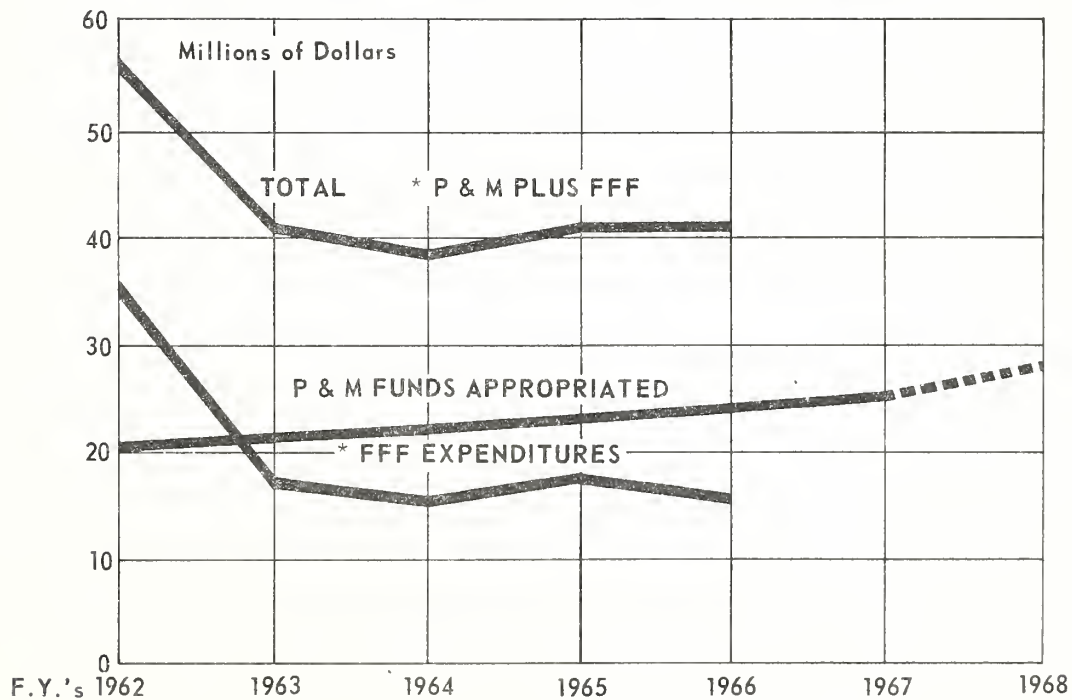


MAN-CAUSED FIRES



1961-65 average: 5,060
Forest Service's goal: 3,500

EXPENDITURES FOR FIRE PROTECTION



* P & M - Forest Fire Protection. FFF - Fighting Forest Fires.

Figure 8-a

Air tankers dropping retardants have proved very effective in reducing fire costs and resource losses.



Reducing fire hazard in high risk area. Increased hazard reduction programs are necessary for more effective fire control.

Fire danger computer - an electronic device which automatically computes fire danger from inputs of essential weather and vegetative conditions.

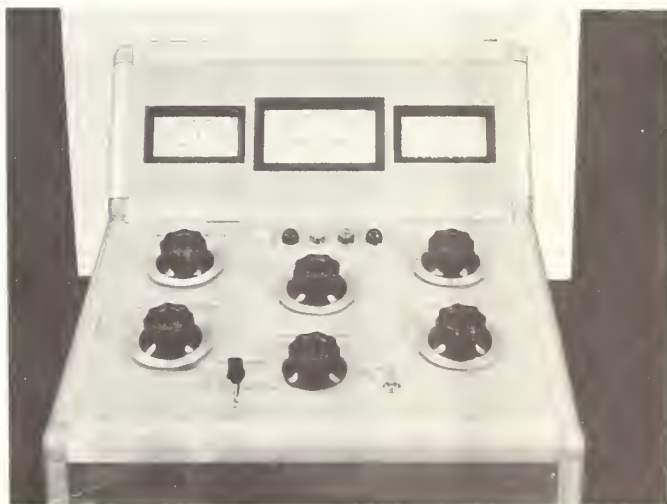


Figure 8-b

	1966	1967	1968	Increase
STRUCTURAL IMPROVEMENTS FOR				
FIRE AND GENERAL PURPOSES ..	\$10,865,000	\$11,040,000	\$11,040,000	- -

No program increase is proposed.

This program provides for the construction, reconstruction, and maintenance of buildings, utilities, airstrips, communications systems, and other facilities throughout the National Forests and National Grasslands.

Amounts estimated for fiscal year 1968, compared with 1966 and 1967, are as follows:

	FY 1966		Available FY 1967		Estimated FY 1968	
	No. of Units	Amount Available (In thousands)	No. of Units	Amount Available (In thousands)	No. of Units	Amount Estimated (In thousands)
<u>CONSTRUCTION</u>						
Dwellings and barracks	53	\$1,150	50	\$1,056	45	\$1,525
Fire lookouts	12	200	12	155	10	216
Service and storage buildings (including offices)	44	1,792	60	1,843	39	1,082
Airstrips and helispots	166	305	300	294	260	254
Communication facilities (radio and telephone)		1,050		1,012		1,012
Site acquisition		100		174		116
Major structures <u>1/</u> ..	3	<u>360</u>	2	<u>318</u>	3	<u>436</u>
Total Construction .		4,957		4,852		4,641
<u>BETTERMENT</u>						
Upgrade existing struc- tures, site improve- ments, landscaping and other miscellaneous construction		615		564		578
Raise standard of existing water and sanitary systems ...	38	<u>515</u>	23	<u>465</u>	60	<u>662</u>
Total Betterment ...		1,130		1,029		1,240
<u>MAINTENANCE</u>						
Maintenance of existing improvements		<u>4,778</u>		<u>5,159</u>		<u>5,159</u>
Total, Construction, Better- ment, and Maintenance		10,865		11,040		11,040

1/ The three major structures planned for construction in 1968 are:

- (1) Barracks, Angeles National Forest, California \$128,000

This is a 2-story barracks (dormitory and dining facilities) to house the Dalton 25-man hot-shot fire crew. This crew had been housed in buildings constructed during the CCC program. Because of their deteriorated condition they were torn down in 1965. The crew is temporarily housed in buildings on the San Dimas Experimental Forest, an arrangement that is not satisfactory due to location and the need of the space by the experimental forest. The fire crew is a key part of the fire organization of the Angeles National Forest and they need to be housed at the Dalton location. Otherwise, it would be impossible to meet fire control standards.

- (2) Ranger station for two rangers in the Stanley Basin-Sawtooth Valley Area, Challis and Sawtooth National Forests, Idaho \$184,000

Facilities to be constructed at this site include two dwellings with basement and garage, a dual ranger's office, and the necessary site development and utilities. The office will provide space for two district rangers and their staff. Since recreation use on the National Forests in this area is above one-half million visits per year, adequate space is needed in the office building to serve the public as well as to administer the National Forest lands. The present facilities are of substandard log construction and provide inadequate space for current and future needs.

- (3) Office for Ketchikan Ranger District, Ketchikan, Alaska \$124,000

A combined ranger office and visitor center is planned to be constructed at a location convenient for forest administration and use by forest users and tourists. This combination will result in reduced total building costs and more efficient use of the personnel in administering the district and serving the public. The present office is in rented quarters in downtown Ketchikan where parking for visitors is very difficult.

Construction

Many ranger headquarters and field projects are located in remote areas or small communities where adequate housing is not available. Unless adequate housing is provided, it would not be possible to headquarter needed personnel at these work locations. Program costs would be increased excessively and the job of managing the lands and serving the public would suffer severely. There is also a great need for additional fire control structures, service buildings, and offices in outlying locations, as well as adequate communications facilities for National Forest protection and administration.

Landing fields, helispots, and heliports are essential to the effectiveness of the fire control program and multiple use management of the National Forests to make the best use of aerial operations and air equipment. They greatly facilitate rapid initial attack on forest fires, thereby increasing the chance for early control at small size which would result in a reduction of both suppression costs and resource losses. Construction and reconstruction of airport facilities such as airfields, heliports, and helispots are urgently needed.

Betterment

Existing facilities must be upgraded in order to continue their useful life. Many were constructed back in the 1930's with CCC labor and funds and require modernization. Some of these needs involve critical deficiencies in water and sewage disposal systems and in unsafe building foundations and electric wiring systems. Modern heating units are needed to replace those that are outmoded. In some instances addition of a room to a small dwelling, cabin, or office would accommodate expanding needs for many years. Some mountain airstrips and helispots have been made unsafe and inadequate for the increased use of large modern aircraft. Obsolete telephone systems are being converted to radio networks. Inadequate radio systems are being improved to meet communications needs.

Maintenance

It is essential in the interest of management economy to keep in reasonable repair the physical plant on which all National Forest activities depend. This plant in the main consists of about:

- 1,800 fire lookout towers and observatories
- 5,300 dwellings, cabins and barracks at field headquarters
- 800 field offices
- 6,300 storage and service buildings
- 3,100 water and sewage systems
- 20,000 radio units
- 1,200 landing fields and helispots
- 16,000 miles, telephone lines

These improvements are dispersed over the National Forests and National Grasslands. They are an integral and essential part of the management and protection of this large land area, involving forest fire protection, timber harvest, watershed protection, and other land use activities.

Maintenance funds are distributed to field units based on the number of improvements by classes currently justified by program utilization and an analyzed unit costs of maintenance. Priorities of maintenance are established at forest, and sometimes regional, levels so that structural improvements vital to protection of the resources will receive an appropriate degree of maintenance.

Examples of Recent Accomplishments

Emphasis has continued on construction of dwellings and barracks to provide housing and crew quarters at locations where private rentals are not available. Field headquarters offices are being provided and obsolete offices replaced to provide adequate working space. Construction of service buildings such as warehouses, shops, and storage buildings at ranger stations has proceeded to fill the most urgent program needs. Following is a list of major structures on which construction started in fiscal year 1966:

Region 1	West Yellowstone Interagency Fire Control Center, Gallatin National Forest, Montana	\$152,000
Region 5	Arcadia (San Dimas) Equipment Development Center, California	130,000
Region 6	Redmond Air Center, Deschutes National Forest, Oregon	105,000

The present rate of construction is providing new buildings and facilities to meet the most urgent needs. Maintenance was accomplished for the high priority needs, but the available funds are inadequate to keep the existing physical plant up to our maintenance standards.

	1966	1967	1968	Increase
PAYMENTS TO EMPLOYEES ¹				
COMPENSATION FUND	\$668,586	\$733,000	\$759,000	+\$26,000

An increase of \$26,000 is required to reimburse the Employees' Compensation Fund, Department of Labor, in accordance with PL 86-767 (5 USC 785), which was enacted September 13, 1960, for benefit payments made from that fund to employees of the Forest Service who are injured while in the performance of duty. The 1968 payment will be \$758,847. The payment for 1967 was \$733,381.

	1966	1967	1968	Increase
WATER RESOURCE DEVELOPMENT				
RELATED ACTIVITIES	\$4,770,000	\$6,766,000	\$8,660,000	+\$1,894,000

An increase of \$1,894,000 is needed to help meet Forest Service responsibilities resulting from installation of water development projects by other agencies. An increasing number of such developments for power, flood control, reclamation and general water supply purposes are being constructed in and adjacent to National Forests and National Grasslands by Federal, State and local agencies, and private groups.

The construction agencies initiate the projects and schedule the performance. The Forest Service cooperates in the planning, development, and management of the water and related resource developments associated with National Forest System lands.

Each project poses resource problems and opportunities peculiar to the individual site under consideration. This requires a comprehensive impact survey by the Forest Service to determine the effect of each water resource development proposal on all the resources and facilities affected by the project. These surveys prescribe the best pattern of multiple use management of the land and identify the resource management adjustments needed to attain maximum benefits from the water project.

The work performed under this program, in addition to impact surveys, includes:

- (1) Liaison with the construction agency.
- (2) Development of public use and management facilities.
- (3) Treatment of lands tributary to or within the project area to provide water flow which will better serve operating requirements of reservoirs and to provide for public safety and enjoyment.

Work and financing planned for fiscal year 1968 is compared with that for fiscal years 1966-1967:

						Project (11)
		<u>Fiscal Year 1966</u>		<u>Fiscal Year 1967</u>		<u>Fiscal Year 1968</u>
		<u>No. of</u>	<u>Cost</u>	<u>No. of</u>	<u>Cost</u>	<u>No. of</u>
		<u>Units</u>		<u>Units</u>		<u>Units</u>
				(Cost in thousands)		<u>Cost</u>
Impact surveys and construction liaison ..	227		\$767	175	\$955	250
Public use, access, and management facilities .	7		3,856	23	5,324	30
Land treatment, soil stabilization and cover improvement	<u>3</u>		<u>147</u>	<u>6</u>	<u>487</u>	<u>25</u>
						<u>1,201</u>
Totals	237		4,770	204	6,766	305
						8,660
<u>Impact Surveys and Construction Liaison</u>						\$1,455,000

Impact surveys are surveys which delineate the effect, define the mitigating measures and enhancement opportunities of water resource developments upon the protection, administration, and management of the National Forests and National Grasslands. Reports resulting from such surveys document items which are essential to the attainment of multiple use objectives when National Forest System lands are related to the project. To be effective, the surveys and reports must be concurrent with the construction agency's preliminary planning and must precede licensing or authorization.

Liaison with the construction agency is necessary during the construction period to facilitate coordination between the construction agency and the Forest Service. Protection of the land and resources, minimizing interference with regular protection and management activities, and facilitating construction agency operations are direct economic dividends derived from this program.

Fiscal year 1968 plans and justification. Experience has shown that without adequate analysis and liaison effort such as is provided by this activity, natural resources often suffer from enormous waste and misuse. Natural beauty and high quality water are among those resources most susceptible to loss. The rising value of forest resources and constant increase in demands against the declining resource base requires increased perception, imagination and thoroughness in the preparation of impact surveys. A continuing program of impact surveys and construction liaison would go forward on about 250 projects.

Fiscal year 1966 accomplishment included impact survey preparation or construction liaison work for 227 projects. Among the projects for which the Forest Service prepared impact surveys during fiscal year 1966 are: West Divide, Bostwick Park, Little Dell, Smokey Range, Palisades, Lynn Crandall and Clark Ranch, Loss Valley, Takatz Creek, Johns Creek, Loudon Ditch, Sullivan Creek, Warm River, Lake Winnibigoshish, Chewalla Creek, Houlka Creek, Stampede, Wynoochee, Garden Valley, Doniphan, and Blair Creek.

Examples of impact survey recommendations resulting in specific and meaningful contributions to natural resource values are:

- a. A water development proponent desired to build an earthfill dam. Borrow material would have to come from adjacent areas of the surrounding forest and, in this case, would have resulted in massive scars and irreparable damage to the natural beauty of the area. On the basis of the impact survey findings the construction agency redesigned the project to use a concrete dam, thus increasing its multipurpose values.
- b. A water development proponent desired to restrict natural channel streamflow releases in connection with a complex water diversion system proposal to the extent that downstream fishery, aesthetic and recreation values would be greatly reduced. A reconnaissance hydrologic survey of tributary National Forest land, made as a part of the project impact survey, indicated a potential for increased water yield through appropriate land treatment measures. Because such additional yields will be available, agreement to the release of adequate minimum flows in the streams was forthcoming without difficulty.

Public Use, Access, and Management Facilities \$6,004,000

Fiscal year 1968 plans and justification. The Forest Service is responsible for providing camping and picnic sites, swimming beaches, boat ramps, sanitation facilities, and other public use and information facilities on National Forest System lands at and adjacent to project reservoirs. These facilities, to serve their intended purpose should, whenever possible, be installed in time to meet the initial impact of visitor use when a new reservoir fills. Installation during the construction period is generally less expensive than after completion of the project. Failure to provide such facilities not only reduces the opportunity for public recreation enjoyment but, also, results in damage to prime recreation sites, destruction of natural beauty, pollution of streams and reservoirs, and conditions hazardous to the health and safety of the using public.

The fiscal year 1968 level of financing would provide needed public access, use and management facilities at 36 projects. The projects are:

Continuation of previous year's starts -- Libby, Hungry Horse, Fryingpan-Arkansas, Flaming Gorge, Joe's Valley, Mason, Cougar, Sam Rayburn, Chewalla, Toledo Bend, Allegheny, Monroe, and Middle Fork Anderson.

New starts in fiscal year 1968 -- Pondere Lake, Boundary, Homestead, Ashurst, Lyman, Tibble Fork, Lost Valley, Union Valley, Wishon, Courtright, Frenchman, Blue River, Kachees - Cle Elum, Cross Florida Canal, Bayou Boeff, Upper North River, South Branch North Fork, South River, Cave Run, Laurel River, Lewis Smith, Basin Brook, and Silvis Lake.

Fiscal year 1966 accomplishment included construction of facilities at seven projects -- Ruedi, Mogollon Rim, Flaming Gorge, Shasta-Trinity, Allegheny, Sam Rayburn, and Monroe.

Land Treatment, Soil Stabilization, and Cover Improvement \$1,201,000

Fiscal year 1968 plans and justification. Treatment of lands tributary to water resource development projects to reduce sediment yield or to modify the pattern of runoff lengthens the life and increases the utility of the water control structures. This work is done on National Forest System lands tributary to the project, only where hydrologic analysis determines that such work is needed and the benefits to the project purpose are clearly established. Treatment programs include the following:

- (1) Modifying the vegetation to decrease erosion, to reduce flood peaks and to increase the annual quantity of water yielded from the tributary lands.
- (2) Clearing reservoir areas, where not done as a part of construction, and keeping the reservoir free of debris to make the area safe for recreation use and to maintain scenic beauty.
- (3) Land treatment measures such as contour terracing, gully plugs, headwaters debris and flow retarding structures, and streambank and shoreline stabilization measures (Figure 11).

Fiscal year 1966 accomplishment included land treatment measures at three projects -- Shasta Lake, Wickiup, and Detroit.



Before



After

Bank stabilization is one form of land treatment designed to (1) minimize stream turbidity and reservoir siltation, (2) halt the continuing loss of usable waterfront land, and (3) enhance natural beauty and water quality. Beauty and adequate functional design are harmonized.

	1966	1967	1968	Increase
FIGHTING FOREST FIRES ...	\$12,500,000	\$5,000,000	\$5,000,000	- -

No program increase is proposed.

The fighting of forest fires on National Forests and Grasslands is provided by this program. In addition to the regular fire protection organization, emergency forces may be employed when fire weather conditions are critical. Experience shows substantial savings are made by having a strengthened force ready to discover and attack fast-spreading fires. Reduction in damage and suppression costs is realized in relation to what might be expected from normal crew strength and normal procedures.

Calendar Year 1965 Fire Season

The lowest burned area in the history of the Forest Service was recorded in 1965 - 75,150 acres. The previous low was in 1962 when 85,457 acres burned. Normal or below normal weather conditions in many places were helpful in attaining this record although several units had periods when fire danger was extreme. Due to dry lightning storms accompanied by strong winds, large fires occurred in late June in Arizona and New Mexico. The critical period of fire weather in mid-September in southern Oregon and northern California produced only a few fires and low burned areas on the National Forests. Fire weather was above normal in Oregon and Washington west of the Cascades. The record low burn area compares well with the five-year average of 208,974 acres. Fast, aggressive action on all fires made this record possible.

Fire occurrence down. The number of fires as well as burned area was down for 1965. There were 9,365 fires reported for 1965 compared with 9,749 in 1964 and a five-year average of 12,393. Lightning fires were 5,243 in 1965, which is above the 1964 figure of 4,617 but well below the five-year average of 7,125. Man-caused fires dropped significantly again in 1965 to 4,122. This is well below the 1964 figure and the five-year average of 5,132 and 5,268 respectively. The 1970 goal of 3,500 man-caused fires seems within reach.

Major fires. Large fires were few in number in 1965. Thirty-six fires over 300 acres were reported, which is a modern day low, and compares favorably with 61 such fires in 1964, and a five-year average of 83. One of the largest fires on the National Forests in 1965 was the Plum Fire on the Nebraska National Forest. It started from lightning on May 5, and burned almost 20,000 acres before it was controlled the next day. Burned area included 11,000 acres of tree plantations. The area had no forests until Dr. Charles E. Bessey, a University of Nebraska botanist, encouraged plantings begun about 1902. The burned area is part of the largest man-made forest in the United States.

Throughout most National Forests and Grasslands, the 1966 fire season was the worst in many years. In the moisture deficient Eastern forests, where the time lag between rain and drought is short, April and May were critical months. By the end of May, dry weather in the West had pushed burning conditions in many areas to the danger point normally experienced in late July. In May, fires had already begun to escape initial attack, "blowup", and require large numbers of men and equipment to control.

Beginning with snowpack deficiencies, fire hazards in much of the West built up steadily from a dry spring through a virtually rainless summer. For example, in the Intermountain Region's Payette National Forest, fire dangers from mid-June to September ranged consistently higher than any experienced in many years - including the severe 1960 season. Annual rainfall recorded at Boise, Idaho through August 31 was only 3.15 inches, a record low, compared with an expected average of 7.68 inches. By late June, fire danger was extreme in Southern California. July, August and early September saw worse-than-normal-burning conditions throughout California, across the Northern Rockies, and the Pacific Northwest. Only in the Southwestern region did rain dampen an unusually severe May and June fire season. And even here, normal summer rains came late to Arizona and New Mexico, so their fire season was extended to mid-July.

To counter the serious burning conditions, several extraordinary measures were taken on a forest, regional, and national basis. Fire prevention efforts were intensified. In the California region, initial attack crews were manned to increased strength. When not fighting fires, the specially trained suppression crews were held on standby near the most critical areas. Crews of Southwest and Montana Indians were similarly used. Cooperative arrangements were strengthened with the Bureau of Land Management, Park Service, and State and local protective associations. Fires were mapped from the air using infrared techniques and equipment. In line with normal practice, detection and initial attack forces, including air tankers, maintained a high degree of surveillance and readiness.

Despite energetic efforts by available prevention and control forces, fire took a serious toll of National Forest resources in 1966. Fuels became so dry that once ignited, many fires spread immediately and rapidly. In the Southwest, the area burned during May and June reached some 31,000 acres, three times the 1961-65 annual average for the area. An airplane crash in mid-June on the Los Padres Forest caused the Wellman Fire -- the season's largest -- which spread over 93,000 acres of the San Raphael Wilderness before being controlled. From the first of July until mid-September, when rains finally came to lower fire danger over much of the area, crews battled 79 large (over 100 acres) fires in Forest Service protection areas in the western regions. Extreme fire danger continued into early November in Southern California, where the 1,900 acre Loop fire on the Angeles National Forest took the lives of twelve men who were caught in a brief flare-up. While this incident was the only one where lives were lost on the fire lines during a long and critical season, the tragedy has spurred renewed and even more vigorous efforts to examine firefighting methods, training, and capabilities so as to insure safe, as well as effective, fire suppression action.

In all, by October 31, 10,672 fires burned 331,435 acres, the largest area since 1960. Of these fires, 4,809 were man-caused. Though a serious loss, the 1966 burned acreage is not large in comparison with what might have happened. Time after time, prompt detection and aggressive initial attack stopped fires from making destructive runs, with 9,952 (93%) of the fires controlled at less than 10 acres. From these successes can be seen the savings gained by having flexible, hard-hitting forces available under very severe burning conditions.

:	:	:	:	:	:
:	1966	1967	1968	Increase	:
:	:	:	:	:	:
: INSECT AND DISEASE CONTROL .	\$12,175,000:	\$12,363,000:	\$12,363,000:	- -	:
:	:	:	:	:	:

No program increase is proposed.

Insects and diseases have a greater impact on the Nation's forests than any other destructive agent. Examples of the damage they do in an average year are:

- (1) They kill 2.4 billion cubic feet of growing stock, including 9.2 billion board feet of commercial sawtimber. This is enough lumber to plank a board-walk two inches thick and three feet wide from the earth to the moon.
- (2) They seriously reduce timber yield by:
 - (a) Retarding growth.
 - (b) Stunting and deforming trees.
 - (c) Delaying stocking.
 - (d) Killing seedlings and reproduction.
- (3) They can prevent the reestablishment of the most suitable and desirable tree species on certain sites. For example:
 - (a) The chestnut blight not only wiped out the American chestnut, it also prevents the reestablishment of this valuable hardwood over the entire Appalachian Range.
 - (b) White pines, one of the most desirable softwoods, cannot be grown on some sites because of the white pine blister rust.
 - (c) The balsam woolly aphid is threatening to sharply limit areas where some species of fir can be grown.
 - (d) Matsucoccus scale and the scleroderris disease pose a like threat to stands of red pine in the Northeast and North Central States.
- (4) Insects and diseases seriously damage recreational areas, mar the scenic attractiveness of forest vistas, and kill and weaken trees that become hazards which must be removed at considerable cost to protect users of recreation areas and other public places.

- (5) Insect and disease-killed trees increase forest fire hazard, the intensity with which fires burn, and the extent of damage they cause.
- (6) When not promptly detected and controlled, insect and disease outbreaks can assume catastrophic dimensions that destroy all forest resources over entire drainages.

The objective of the pest protection program is to reduce by preventive measures and direct control action the huge damage and losses that pests inflict on forest resources. The program goal is to hold pest-caused damage and losses to levels commensurate with the uses and values for which specific forest areas of any ownership are managed, so that future national needs for wood products, recreation, and other forest uses can be met.

The pest control effort for fiscal years 1967 and 1968 must, of necessity, be estimated. This is because the onset, severity, frequency, and scope of pest outbreaks fluctuate widely, and reliable predictions of specific needs cannot be made one and two years in advance. The estimated pest control effort for the 1966-1968 period is:

<u>Item</u>	<u>1966</u>	<u>1967</u> (In thousands)	<u>1968</u>
(1) For surveying forest lands of all ownerships to detect, delineate, and evaluate pest outbreaks, and to provide experienced leadership in planning and directing control operations	\$2,671	\$2,773	\$2,890
<p>The expansion over the three-year period indicated for this item, which is made by corresponding reductions in other items, is to strengthen the national program of pest detection and evaluation. Experience has shown that the sooner control action can be taken, once need for control has been determined, the less the ensuing damage and cost.</p>			
(2) For controlling bark beetles by treating infested trees, cull logs, and stumps ..	\$2,045	\$2,427	\$2,630
Acres to be treated	974	1,156	1,252

<u>Item</u>	<u>1966</u>	<u>1967</u> (In thousands)	<u>1968</u>
(3) To control insects that feed on foliage, shoots, buds, and seeds	\$2,614	\$2,326	\$2,006
Acres to be treated	1,300	1,000	900
Costs of controlling pests, for this item, which is largely done by aerially applied pesticides, have risen in recent years due to modifications in spraying methods to provide a wider margin of safety to fish and wildlife. Modifications entail:			
(a) Greater use of helicopters.			
(b) Use of more costly pesticides.			
(c) A more elaborate monitoring program to check pesticide impacts on the forest environment.			
(4) To control tree diseases, such as blister rust, oak wilt, dwarfmistletoe, and root rots	\$4,000	\$3,992	\$3,992
Acres surveyed to locate infected trees .	40,000	40,000	40,000
Acres to be treated	500	500	500
(5) For methods improvement and developing and testing new equipment and pesticides	<u>\$845</u>	<u>\$845</u>	<u>\$845</u>
Total	\$12,175	\$12,363	\$12,363

From this input of effort will result an annual output in timber and forests protected estimated to be:

(1) Some 5-1/3 billion board feet of timber saved.

(a) In terms of stumpage, this volume of timber would carry a price tag of about \$42 million.

(b) In terms of lumber and other wood products, it would carry a price tag of \$420 million.

(c) It represents enough lumber saved to build 512,000 average-sized homes.

(d) To harvest this volume of timber and convert the logs into manufactured wood products would require 80,000 man-years of employment.

- (2) If but one of the 82 outbreaks usually controlled annually should go unattended and get out of hand, the ensuing epidemic could disrupt the economy of an entire lumbering community.
- (3) Timely control also protects recreation areas from the unsightliness and hazards arising from a forest of snags, along with the heavy expense of snag removal around dwellings and campsites to safeguard people and property.

Examples of Recent Accomplishments

Prompt action in suppressing bark beetles prevents widescale loss of commercial timber. Bark beetles kill huge volumes of sawtimber throughout the Nation each year. The losses they cause approximate one-third of the total timber harvested. During periods of outbreak, losses are greatly increased, occasionally bordering on the catastrophic, at which time they approach or exceed the average annual cut. An example of the latter was the epidemic of Engelmann spruce beetle which, in the early 1940's, killed four billion board feet of spruce and one-half billion board feet of lodgepole pine on one-half million acres of forest land in Colorado. The outbreak built up in windthrown timber that masked its real potential until it had developed into an epidemic of fantastic proportions, enveloping all trees in its path. The epidemic was finally brought under control by a massive and costly control campaign, plus the help of prolonged subzero temperatures.

Prompt action to suppress incipient infestations prevents intensification and spread and protects the commercial and aesthetic value of the resource. In 1966, 82 outbreaks of bark beetles were detected and suppressed in the early stages of their build-up. The value of timber saved by control action is estimated at \$16.4 million.

Non-persistent insecticide found promising for controlling spruce budworm, an important forest defoliator. DDT, a persistent pesticide, long used for successful and inexpensive control of spruce budworm, may soon be replaced by a newly found non-persistent chemical that in tests to date show little, if any, adverse effects to fish and wildlife. The new insecticide appears to be highly effective against the spruce budworm, a major pest of spruce and fir timber from coast to coast. Testing and analysis of results are continuing.

Monitoring aerial insect spraying projects intensified to determine possible adverse effects to fish and wildlife. In conjunction with field testing of non-persistent insecticides to control forest defoliating insects, a greatly increased effort was made to determine their possible adverse effects on fish and wildlife. Biologists in Federal and State governments monitored effects on beneficial insects, fish, fish-food organisms, birds, and small mammals. Results of monitoring information to date indicate little, if any, harmful side effects of the spray.

Federal-State cooperative insect and disease control program expanded. In 1966 three additional States, making a total of 23, entered into cooperative agreements with the Forest Service to share the cost of forest insect and disease control on non-Federal lands. The intensification of surveys on non-Federal forest lands is expected to result in improved detection and suppression of pest outbreaks.

Little known insect erupts in outbreak numbers at new locations in California and Arizona. The white fir needle miner, a pest insect heretofore restricted to parts of southern Utah, appeared in outbreak numbers in fir stands of the central Sierra Nevada Mountains in California and in northern Arizona. Surveys are being intensified to delineate areas of infestations and to determine whether or not there is need for control.

Timber values saved by white pine blister rust control. Uncontrolled white pine blister rust would reduce white pine timber in eastern United States by 50%, in Idaho and Montana by 90%, and in Oregon and California by 70%. This would amount to a yearly loss of 113.5 million cubic feet currently valued at \$12.3 million. Accomplishments to prevent such losses in 1966 were:

- (a) Maintaining control previously established on 1.8 million acres;
- (b) Establishing control on 94,000 acres;
- (c) Establishing partial control on 194,000 acres; and
- (d) Completing a procedure for determining on any specific area the cost-benefit ratio involved in controlling blister rust in Eastern States, and work on a similar procedure in Idaho and Montana.

	1966	1967	1968	Increase
ACQUISITION OF LAND, WEEKS ACT	\$680,000	\$2,480,000	\$2,480,000	- -

No program increase is proposed.

Acquisition of key inholdings within the National Forests and National Forest purchase units becomes increasingly urgent. The Development Program for the National Forests recognized the need to ultimately acquire about 7,000,000 acres of private inholdings in need of land rehabilitation. Included are lands depleted by repeated fires, poor logging practices, clearing and cultivation of steep and erodible mountain lands, and disturbed mineral exploitation areas. Many of the lands in need of rehabilitation are located in economically depressed areas and/or are within a working radius of Job Corps Centers. Their acquisition will provide additional lands which will contribute to a healthful working environment for the Corpsmen.

The objective of the present 10-year program (1963-1972) is to purchase 967,000 acres of key inholdings of land for National Forest purposes. These are lands valuable for watershed and timber production purposes and having only secondary value for recreation. Lands primarily valuable for recreation are not included. Recreation type lands are included under the Land and Water Conservation Fund Act program.

The fiscal year 1968 estimate will permit further progress toward acquiring the 967,000 acres.

Included in the amount shown is \$1,800,000 for the acquisition of land in the Redbird Purchase Unit in eastern Kentucky (a part of the Appalachia program). An estimated 51,400 acres will be acquired with these funds. These lands, when acquired, will permit an immediate management program of land rehabilitation, recreation development, fire protection and road construction employing local residents in an economically depressed area. Floods originating from this area have in past years caused multi-million dollar downstream damage.

The remaining \$680,000 will be used to continue the regular Weeks Act program at its present level. This will permit the acquisition of an additional 22,520 acres of key inholdings.

See tabulation on pages 73 and 74 for more detailed information on actual and planned accomplishments for fiscal years 1966-1968.

Examples of Recent Accomplishments

In 1966 a total of 190 tracts were contracted for purchase under authority of the Weeks Act using regular appropriated Weeks Act funds. These cases involved the acquisition of 23,452 acres at a total cost of \$678,509. These transactions involve lands suited to timber production and watershed protection in areas where National Forest ownership needs to be consolidated or extended to facilitate these programs. Many of the smaller parcels, 20-40-80 acres in size, are purchases made at a price equal to or nearly equal to the cost that would otherwise have been incurred to survey, post, and mark the National Forest boundary surrounding the property.

Cost Avoidance Attributable to Weeks Act Purchases (except Redbird)

Through purchase of the 190 tracts contracted in 1966, the Forest Service will avoid constructing some segments of roads and locating and/or posting property lines. In addition, processing costs of land trespass cases and other management costs are also avoided through the regular Weeks Act purchases. Studies made in previous years have shown substantial savings through cost-avoidance as a result of the purchase program. The estimated 10-year cost-avoidance attributable to the tracts purchased in 1966 is \$313,500.

The estimated 10-year cost-avoidance with purchase of the tracts proposed in 1968 is \$360,000. Involved are an estimated 240 cases totaling 22,520 acres.

State and Forest	FY 1966 Actual			FY 1967 Estimated			FY 1968 Estimated		
	Options:	1/	Options:	Options:	Options:	Options:	Options:	Options:	Options:
	Accepted:	Acres:	Obligation:	Accepted:	Acres:	Obligation:	Accepted:	Acres:	Obligation:
Alabama - Wm. B. Bankhead	1	80:	\$3,983:	1	100:	\$5,000:			
Talladega									
Arkansas - Ouachita	1	168:	4,480:	2	230:	10,530:	2	625:	\$25,000
Ozark	14	2,704:	71,708:	7	1,541:	43,392:	15	1,500:	50,000
Florida - Ocala	1	10:	1,500:						
Illinois - Shawnee	24	1,739:	79,515:	21	2,343:	82,000:	30	2,000:	71,000
Indiana - Hoosier	29	2,006:	88,078:	20	1,500:	58,500:	45	2,000:	71,000
Georgia - National Forests in Georgia							8	600:	35,000
Kentucky - Daniel Boone	3	274:	3,890:	2	1,028:	31,850:	6	875:	35,000
Redbird Purchase Unit				5	49,098:	1,716,000:	11	51,400:	1,800,000
Michigan - Hiawatha	1	1,040:	11,200:	12	1,000:	25,000:	10	1,600:	40,000
Huron-Manistee	9	2,389:	53,875:	21	1,940:	44,900:	20	1,500:	20,000
Ottawa	4	395:	4,224:	6	974:	10,100:	10	800:	10,000
Minnesota - Chippewa	5	480:	4,040:	3	200:	5,000:	5	500:	5,000
Mississippi - Holly Springs				1	100:	5,000:			
Missouri - Clark	13	1,969:	45,543:	13	1,300:	35,000:			
Mark Twain	13	1,465:	38,036:	10	900:	25,000:	15	2,000:	50,000
New Hampshire - White Mountain ..	1	1/2:	25:	2	210:	5,000:	2	250:	5,000
North Carolina - Pisgah	1	87:	5,500:						
Uwharrie	1	112:	4,492:						
Ohio - Wayne	44	3,250:	82,288:	19	1,830:	58,500:	40	1,800:	63,000
Oklahoma - Ouachita	2	509:	13,786:	1	160:	2,800:			

Weeks Act Purchases 1966-1968--continued

State and Forest	FY 1966 Actual			FY 1967 Estimated			FY 1968 Estimated		
	Options:	1/	Options:	Options:	Options:	Options:	Options:	Options:	Options:
	Accepted:	Acres:	Obligation:	Accepted:	Acres:	Obligation:	Accepted:	Acres:	Obligation:
South Carolina - Sumter	2	69:	5,790:	1	64:	5,400:	:	:	:
Tennessee - Cherokee	7	711:	25,439:	2	650:	20,000:	:	:	:
Vermont - Green Mountain	:	:	:	2	400:	10,000:	:	:	:
Virginia - George Washington	6	2,370:	77,409:	3	360:	15,800:	2	1,970:	60,000
Jefferson	7	1,573:	29,903:	5	1,830:	49,600:	:	:	:
West Virginia - Monongahela	1	52:	1,044:	:	:	:	10	2,000:	100,000
Wisconsin - Chequamegon	:	:	:	2	440:	10,000:	5	1,000:	20,000
Nicolet	:	:	:	4	335:	10,000:	15	1,500:	20,000
Total	190	23,452:	655,748:	165	68,533:	2,284,372:	251	73,920:	2,480,000
Surveys and related acquisition costs	:	:	22,761:	:	:	195,628:	:	:	:
Total obligations	:	:	678,509:	:	:	2,480,000:	:	:	2,480,000

1/ Excludes obligations of \$970,784 against accelerated Appalachian funds appropriated in fiscal year 1965.

A hybrid pine for Christmas trees. Christmas tree growers are interested in a hybrid pine developed at Berkeley, California. The tree, a hybrid between two races of lodgepole pine, has desirable Christmas tree traits--good form and color, rapid growth, and early production of persistent cones. Little is known about the growth of this hybrid outside California, but plantings are being made in the East, Pacific Northwest, and other regions to test its suitability.

Straight-grained sweetgums may produce better lumber and veneer. The most obvious fault of sweetgum for lumber manufacture is the warping thought to be related to "interlocked grain." Studies of 225 sweetgums growing in seven southeastern States indicate this undesirable feature of sweetgum may be genetically controlled. Thus, choosing straight-grained seed parents may eliminate troublesome problems in processing sweetgum lumber and veneer.

Jack pines differ in susceptibility to the needle cast fungus. After 10 growing seasons, 29 seed sources from northeastern Minnesota had only about 25% infection. Trees from a lower Michigan source showed 95% infection. Since these differences remain constant from year to year and from environment to environment, they are genetically controlled. Selected trees from these seed-source tests provide geneticists with breeding material to develop strains of jack pine resistant to the needle-cast fungus.

Paper mill effluent used to irrigate pines. Three years of study in Louisiana showed that paper mill effluent may safely be used to irrigate pines. If strong wastes are avoided, as much as 20 to 40 area inches of effluent can be disposed of in this way. Trees benefit, and a major source of pollution is kept out of streams.

Warm nights make better seedlings. Night temperature in the nursery influences the vigor of ponderosa pine seedling roots. In California, ponderosa pine transplants from a nursery with warm nights produced more and longer roots than transplants from another nursery with cold nights. Nights warmer than 40°F., but 19 to 26 degrees cooler than day temperatures gave the greatest root production. This day-night temperature difference may prove to be important in selecting nursery sites for ponderosa pine.

Size of openings determines hardwood species in next crop. Different management systems were compared in Appalachian hardwoods in West Virginia. When trees were harvested singly to maintain a continuous forest cover:

- (1) The proportion of sugar maple increased.
- (2) The proportion of yellow-poplar, red oak, and black cherry decreased.

Thus, species composition can be controlled by varying the size of opening made in harvest cuts. These findings indicate the degree of flexibility possible in managing forests to meet multiple use objectives.

Redwood reseeds itself dependably. Seed production of redwood was consistently high during 5 years after harvest cutting. Many seedlings became established on favorable seedbeds, and sprouts grew to 15 feet in height, assuring the start of a new forest. Natural regeneration is much cheaper than planting. With the rapid establishment and fast growth of redwood, prospects for profits are very good.

Variation in peatland productivity explained. Black spruce in Minnesota bogs grew fastest along channels of flowing water. These "water tracks" support a great variety of bog plants. The more distant "muskegs" have fewer species and slower tree growth. Chemical analyses showed that "water tracks" carry nutrients into the bog from mineral soils, but "muskegs" have no source of nutrient replenishment except rain.

Rectangular plantation spacing saves money. Rectangular spacing was better than square spacing in a slash pine plantation in Georgia. This means that far fewer rows need to be planted. Hand or machine planting costs can be reduced, and access to the plantation is easier.

One cord of pine pulpwood removes 5.46 pounds of minerals. In the Southeast, one cord (5,000 pounds) of loblolly pine pulpwood contains 0.25 pounds of phosphorus, 1.52 pounds of potassium, 1.69 pounds of calcium, 0.56 pounds of magnesium, and 1.44 pounds of nitrogen, or a total of 5.46 pounds of these nutrients. The harvest of several successive crops of trees could result in deficiencies of mineral nutrients in poorer soils.

Acid paste reduces gum production costs. The naval stores industry could save \$5,000,000 each year from the use of sulfuric acid paste. The paste is better than a water solution of acid now used to stimulate the flow of gum. Chipping labor costs can be cut as much as \$4 per barrel of gum. Better grades of gum, worth \$2 to \$4 more per barrel, are recovered because acid contamination is reduced. Prolonged flow of gum requires larger cups, but it lengthens collection intervals to four weeks. The result is an additional cost saving up to \$2 per barrel.



GAIN IN GUM YIELD OF SLASH PINE THROUGH SELECTION AND BREEDING

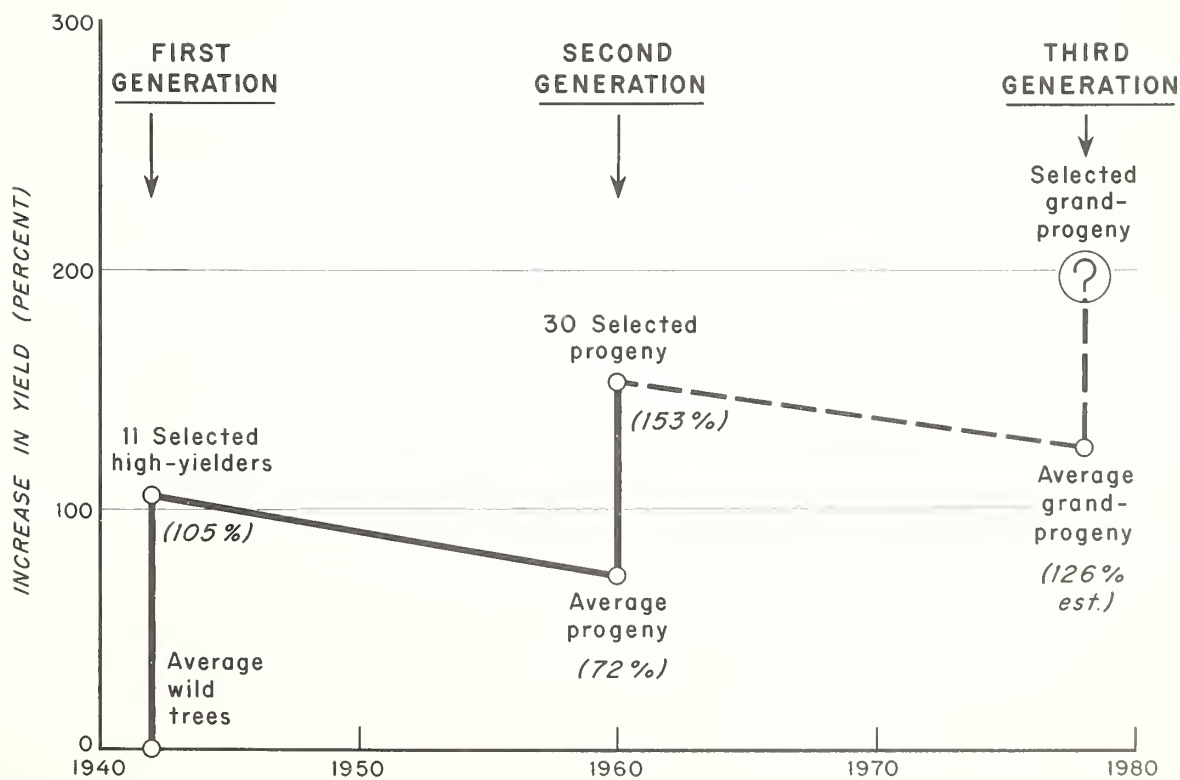


Figure 15

	1966	1967	1968	Increase
WATERSHED MANAGEMENT RESEARCH	\$3,280,000	\$3,439,000	\$3,650,000	+\$211,000

An increase of \$211,000 is needed to supply a stronger technical basis for management of National Forest watersheds and similar water-producing mountain lands. The proposed increase will strengthen research on:

- (1) Water yield improvement from eastern slopes of the Cascade Mountains of Washington and Oregon.
- (2) Rehabilitation of gullied forest lands in the south coastal plains.
- (3) Increased recharge of groundwater in south by vegetation manipulation.
- (4) Reduction of erosion and sedimentation from granitic areas of Idaho and Montana.
- (5) Methods of watershed analysis, correlation, and synthesis to provide a more precise method of predicting results of management measures and to extend research results to larger areas.
- (6) Improvement of hydrologic and productive characteristics of bog and swamp forests of the Lake States.

The dollar input in watershed management research during the past 7 years has averaged \$2,348,371 annually. Research to date indicates that if studies are continued and if improved watershed practices are suitably applied, high quality usable water can be increased by 14 million acre-feet annually. This additional water has an estimated primary delivered value of \$734 million annually. Costs of producing the additional water are expected to be less than \$10 per acre-foot, leaving a net annual value of approximately \$600 million. In addition, management methods to be developed by research can conceivably prevent up to 80% of the direct flood and sediment damages that would otherwise occur due to overuse or improper use on presently undamaged watersheds. Direct benefits should exceed \$275 million annually, plus side benefits of nearly \$50 million. Furthermore, it is estimated that about 100 million tons of sediment are coming from deteriorated forest and rangelands. Rehabilitation of the sediment producing lands, based on research-derived techniques, could result in annual savings of approximately \$75 million.

Watershed management research consists of both basic and applied studies designed to develop methods and techniques for managing forest and related range watersheds to:

- (1) Increase water yields or improve timing of water yield to streamflow.
- (2) Give adequate protection to forest soil and water resources while other productive resources of the forest are being used.
- (3) Rehabilitate watersheds that yield damaging flood runoff and sediments.
- (4) Aid forest soil development and improvement.

One-third of the area of the United States is forested. These forests, with associated range and alpine areas, yield about three-fourths of the Nation's streamflow. Management of our forests, more than any other lands, is important to the quantity and quality of water produced.

Examples of Recent Accomplishments

Breakthrough in snowpack measurement. A breakthrough in technique for measuring snow for predicting summer water supplies has been made in California. The new system may eliminate or greatly reduce the need for snow survey crews to make dangerous monthly treks into the mountains. A nuclear instrument that measures the depth and density of snow has been adapted to the needs of snow surveys. The measurements do not destroy the sampling site, as other methods do, so it can be sampled again and again. In addition, the motorized gage can be operated by radio from an office miles away, with the measurements transmitted back by radio. The system can be used in glacier research in Alaska and snow research on the Continental Divide. As it can sense high rate of snowmelt from rain-on-snow storms, it will be invaluable in flood forecasting.

Soil erosion in logging areas is directly related to roads. Studies of logging systems on watersheds with granitic soils show that road building should be avoided wherever possible, or kept to a minimum. Dams on an experimental watershed caught 20 thousand tons of sediment per square mile when logging roads were 300 to 400 feet apart. Most of this sediment was deposited immediately after road building and after a large storm several years later. On a watershed with few logging roads spaced at 1,000- to 1,500-foot intervals, only 43 tons of sediment per square mile were deposited--0.2% of the sediment from the area of closely spaced roads. Where erosion hazards are high, logging systems that require few roads should be utilized.

Squaw carpet has high potential for rehabilitating damaged rangelands. A little-known ground cover shrub called "squaw carpet" holds considerable promise for rehabilitating damaged watersheds. Many single plants grow to 10' in diameter and even larger (Figure 16, top). Every branch of this prostrate shrub is abundantly rooted, giving the plant exceptionally good soil-holding capability. The native range of squaw carpet is limited to the Sierra Nevada and Cascade Mountains of the far West. Outplantings in Idaho and Utah survived better than a control planting in its native range. Furthermore, in Idaho the greatest survival was found on the most severe site--a steep, unstable, infertile road fill of decomposed granite. The extension of the range of this useful plant will be most valuable in rehabilitation work.

Detergents reduce erosion from burned chaparral watersheds. Treatment of water-repellent soils with a detergent resulted in a 95% reduction in debris movement and a fourfold increase in grass establishment on burned chaparral watersheds in southern California. The water-repellent characteristic means that rain falling on these soils does not soak in but runs off rapidly, eroding the soil as it goes. Detergents tend to counteract the water-repellent nature of these soils, allowing the water to penetrate. Under normal rainfall the wetting agent will remain effective for about one year. Detergent sprays to hold soil in place on steep, newly burned slopes may be useful to prevent excessive damage to densely populated areas below.

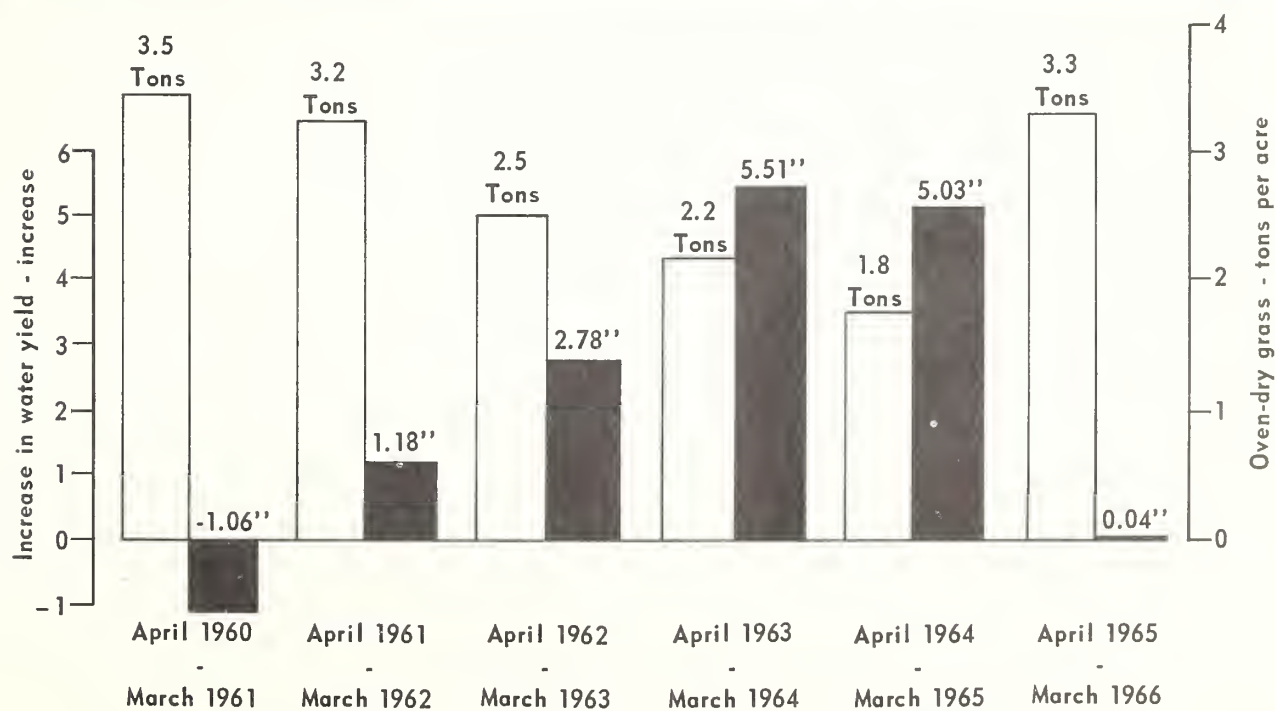
Water use determined by the production of vegetation. Water yield increased as newly established grass cover declined on an experimental watershed at the Coweeta Hydrologic Laboratory in western North Carolina. In the first year after removing the original forest cover, seeding grass, and fertilizing, the grass was tall and deep-rooted. It used as much water as the forest it replaced although the water use occurred earlier in the growing season. Without subsequent fertilization in succeeding years, grass production decreased and water yield increased (Figure 16, bottom). After five years water yields were over 5" greater per year than with the original tree cover. Then fertilizer was again applied. Grass production went up, and water yield decreased to original levels. This showed the direct relationship between herbage production and water use. For maximum water yields through vegetation change, watershed managers should aim for a grass cover having shallow roots, low vigor, and just enough density to hold the soil and prevent erosion.

Forest cutting provides more water during droughts. Complete clearing of the forest by cutting and use of herbicides prevented any vegetative growth and increased water yield by 6" during the dry summer of 1965. This period was by far the driest in the 15 years of record on the Fernow Experimental Forest in West Virginia. Six inches more water amounts to 900 gallons per day from each treated acre--enough to meet the daily needs of 15 people during the drought period.

Streamwater showed no residue after spraying with DDT. No significant amount of DDT was found in streamwater before or after spraying to control the Douglas-fir tussock moth in Oregon. A general increase of DDT in the food chain did appear after spraying. Cooperators from the Oregon State University Department of Fisheries and Wildlife found traces of DDT in animal life even before the spraying was done, and these traces increased after spraying. The highest DDT residue--1.2 parts per million--was found in trout while the lowest was 0.002 parts per million in herbivores. Careful spraying of DDT to avoid watercourses can control insects effectively without hazard to streams.



A typical squaw carpet plant provides an excellent protective covering for the soil.



ANNUAL WATER-YIELD INVERSELY RELATED TO GRASS YIELD

	1966	1967	1968	Increase
RANGE MANAGEMENT RESEARCH ..	\$1,258,000	\$1,294,000	\$1,294,000	- -

No program increase is proposed.

The key to continued use of nearly 900 million acres of public and private range and pasture land lies in the development of sound principles of management from firmly established research findings. Grazing on this vast area is the largest single use of land in the United States but new increasing demands from related uses on the resource must be recognized and to which research must be oriented.

Range management research is seeking the best, most practical and most rapid means to manage and improve the productivity of forested and related ranges in full recognition and alignment with other coordinate uses. Toward this end the program will move ahead on the highest priority studies which are underway. New research will be undertaken as opportunity is presented through completion of current studies. On-going research will stress increased emphasis on the fundamental ecology and physiology relations of forest range vegetation in order to provide a basis for improved range management; designing and implementation of new systems of management, conversion, improvement and accompanying management particularly of woodland and chaparral ranges will be given high priority.

Demands on rangelands will increase for additional meat and other livestock products as well as for less tangible products offered by a properly managed resource. For example, projections indicate that beef cattle will increase from approximately 60 million head in 1960 to 105 million in 1980.

During the same period, big-game hunters will probably increase from 6.3 million to 12 million. Pressures to produce forage for more big game will be substantial. Water needs may increase from 345 to 560 billion gallons per day, demands for timber products may increase 45%, and demands for outdoor recreation will intensify rapidly. Therefore, range research must not only provide maximum production and utilization of forage, but also maintain or improve other values of the basic natural resource.

Because of the immense area of rangeland, even small per acre increases in yield or reduction in management costs can have substantial effects. For example, research conducted at Alexandria, Louisiana, is applicable to some 50 million acres of southern pine forest range. Past research has shown that returns from this area can be increased from \$1 to \$3 per acre through improved management. At Dubois, Idaho, research demonstrated that sagebrush can be effectively eliminated through planned burning. Costs are less than \$1 per acre vs. \$3 to \$5 or higher for chemical or mechanical control. Sagebrush control is currently needed on about half of the sagebrush-grass type, covering about 95 million acres.

Grazing is now and will continue to be the dominant land use on vast areas of public and private lands. Range management research provides the necessary guides for attaining maximum economic returns to ranchers.

Examples of Recent Accomplishments

Burroweed competes strongly with grasses for limited soil moisture. Grass yields were reduced as much as 50% in southern Arizona by competition from burroweed, a shrub with little or no forage value. Measurements showed that winter accumulation of soil moisture was completely expended to a depth of two feet or more before summer rains began. Since grasses did not start using moisture until spring and summer, from 30 to 100% of the soil moisture was not put to beneficial use. Studies are now underway to determine possibilities of making more efficient use of winter-spring moisture by desirable forage plants.

Simulated grazing damages weeds more than grasses. Clipping studies on mountain grasslands in Utah showed a wide variation in reaction of range plants to herbage removal. Plants such as tall bluebell, aster, and cinquefoil were severely damaged by top removal, particularly during flowering. Grasses generally benefited from reduced weed competition and conspicuously increased in yield. Such studies provide guides for manipulation of grazing to allow the most desirable composition of vegetation for maximum livestock production.

Weeds and shrubs supply sufficient protein for minimum requirements of grazing cattle. Bluestem ranges of the Ozark region are thought to be deficient in several nutrients during most of the season. However, a study in Missouri showed that cattle would acquire enough protein to satisfy minimum requirements throughout the season by selectively grazing forage supplied by weeds and shrubs. This study also showed that minimum phosphorus requirements could not be supplied. This strongly emphasized the need for providing livestock with a phosphorus supplement on these ranges.

Increased profits from improved grazing management. Beef production was increased by more than \$1 per acre per year in Arizona through improved management. Intensity of use was reduced, and yearlong grazing was changed to alternate-year summer deferment. Similar increases could be obtained by applying these practices to 6 million acres of high-potential semi-desert range in Arizona alone. Most of this area has been grazed on a yearlong basis. No provision has been made for the periodic rest needed to restore plant vigor.

Invasion of halogeton can be prevented by proper grazing. Invasion of the poisonous weed, halogeton, into stands of crested wheatgrass in central Utah was associated with intensity of grazing, season of grazing, precipitation patterns, and soil disturbance. Heavy infestations were particularly correlated with heavy spring and early summer grazing. Maintenance of desirable vegetation by proper grazing management can prevent establishment of this weed.

Requirements for grazing Arizona ranges determined. Ample green forage is supplied by pinyon-juniper ranges in northern Arizona from April 1 to September 30. Some also is produced during the entire winter. Cool-season grasses reached peak growth in June and remained partly green all year. Warm-season grasses were green only in summer and fall, and they reached peak growth in September. The amount of growth of each grass species was influenced mostly by precipitation prior to and during the period of active growth. Grazing systems should provide for occasional rest during these periods. Warm-season species can be favored most by resting between July 15 and October 15, and cool-season species by resting during April, May, and June.

Helicopter useful for range fertilization. Additional acreage in California's annual-plant ranges might be fertilized if better methods of application were available. Ground application is impractical on much of the steep, rocky, foothill range. Fertilizing this kind of range with fixed-wing aircraft may also be impractical. At the San Joaquin Experimental Range, a helicopter has been used successfully to make two applications of sulfur on a steep, rocky foothill range. Rate and distribution of fertilizer were good, and the average cost of \$2.85 per acre for each application was reasonable. Helicopters may be the answer for practical application of fertilizer on foothill rangelands.

Reduced rates of range seeding prove to be adequate. Crested wheatgrass stands in New Mexico achieved their maximum development within 5 to 8 years, regardless of rate of seeding or drill-row spacing. Herbage yields were essentially the same for 2-, 4-, and 6-pound per acre seeding rates and for 6-, 12-, and 18-inch row spacings. The results showed that seeding rates could be reduced thereby reducing seed costs. The 4-pound rate would save nearly \$1 per acre in seeding costs over the usual 6-pound rate.

	1966	1967	1968	Increase
WILDLIFE HABITAT RESEARCH ...	\$730,000	\$912,000	\$912,000	- -

No program increase is proposed.

Wildlife habitat research develops better management practices to support optimum game and fish populations. Special practices are developed for increasing game food and cover by seeding, planting, burning, spraying, and fertilizing. Competition between wildlife and livestock is determined on various types of forest and rangelands in order to integrate wildlife, livestock, and timber production. Likewise, effects of silviculture and timber harvesting on food and cover plants used by wildlife must be known. Research is conducted to improve fish habitat through regulation of water temperatures, creation of gravel spawning beds, and stabilization of stream channels.

The Nation's forest and related rangelands provide the main habitat for an estimated ten million big-game animals and countless other species of wildlife. These lands also provide important fish habitat. All are a source of interest and beauty. Demands by hunters, fishermen, and nature enthusiasts are ever increasing. National Forests alone contain over 80 thousand miles of fishing streams and nearly two million acres of lakes. Although habitat conditions on some areas are suitable for supporting high wildlife and fish populations, the capacity of most forest and related rangelands can be materially increased through research. Some low-producing areas are ugly pictures of land abuse. They result from poor logging practices, fire, or overuse by livestock or big game.

Information on ways and means to increase habitat productivity is needed by small woodland owners, as well as by managers of large forest properties. Wildlife resources are ever increasing in monetary value to private landowners through sale or lease of hunting and fishing privileges. The wildlife habitat research program involves active cooperation with Federal and State fish and game agencies and educational institutions.

Examples of Recent Accomplishments

Juniper-pinyon range restoration increases forage for deer and livestock.

Closed stands of juniper-pinyon in Utah often produce less than 100 pounds of forage annually per acre. However, eradicating trees and seeding desirable plants increased forage production to over 700 pounds per acre. (See Figure 18.) Deer use in untreated juniper-pinyon stands averaged only 4 deer-days per acre as compared to 83 deer-days per acre on seeded stands--a twenty-fold increase. Such treatment also benefits livestock because 4 acres of treated range will support one cow without interfering with use by deer. Watershed values are also greatly improved by these restoration treatments. Ground cover increases from 25% on untreated areas to 73% on seeded areas. Such restoration treatments can be applied to 13 million acres in Utah alone.

Browse shrubs can be improved by selection and breeding. Striking variations have been found in populations of several native shrubs. Individual plants of big sagebrush growing side by side differ markedly in palatability to deer. Palatable and unpalatable strains of rubber rabbitbrush have been isolated (Figure 18, bottom). Several other shrubs show great promise for improving browse characteristics by selection and hybridization. These offer exciting and profitable possibilities for "tailoring" shrubs to fit various wildlife habitats and uses.

Moist heat speeds germination of legume seeds. In the Southeast fire may benefit several species of leguminous plants. Laboratory treatments applied to seeds of partridge pea indicated that moist heat is most effective in increasing germination. This helps to explain why legumes vary in occurrence in flatwoods pine stands burned annually. It also suggests how time of burning can be modified to assure maximum yield of legumes important for wildlife food.

Land use influences spawning of anadromous fish. Cooperative studies in California have shown that:

- (1) Shading decreased growth of algae and greatly increased the population of fingerling steelhead and silver salmon.
- (2) Water temperatures varied with stream depth and degree of exposure to sunlight--as much as 15° over a distance of 600 feet.
- (3) Terrestrial as well as aquatic insects contributed considerably to supply of fish food.

These studies show the importance of streamside vegetation management to spawning and rearing of fish.

Forage yield in southern forests governed by timber density. Forage is a harvestable product on 58 million acres of loblolly-shortleaf pine-hardwood forests of the South. In east Texas, herbage yields per acre were 800 pounds or more in the open, but they decreased to about 100 pounds per acre with increasing tree cover. Pinehill bluestem, one of the most important cattle forage species, contributed most to herbage where trees were sparse. It gave way to unpalatable grasses as timber stand density increased. Two-eyed berry, a good winter deer forage plant, was scarce in the open but was the most frequent herb beneath dense timber. Consequently, reduction in grazing values as timber density increases may be more critical for cattle but less critical for deer. Data on timber stand density now can be used to predict forage yields and to determine carrying capacity for livestock and game.



Before removal of pinyon-juniper stand the annual forage production is less than 100 pounds per acre .

Seven years after treatment the native shrubs and planted perennial grasses produce more than 700 pounds of forage per acre .



Deer preferred the strain of rubber rabbitbrush on the left—grazing off 90 percent of the plants . The strain on the right was only grazed 20 percent .

:	:	:	:	:	:
:	:	:	:	:	:
:	1966	1967	1968	Increase	:
:	:	:	:	:	:
:	:	:	:	:	:
:	FOREST RECREATION RESEARCH .	\$516,000:	\$479,000:	\$811,000:	+\$332,000:
:	:	:	:	:	:

An increase of \$332,000 is needed to strengthen research on:

- (1) Ecology and use of the unique Boundary Waters Canoe Area in the Lake States.
- (2) Ecology, protection, and management of western wilderness areas.
- (3) Forest recreation in the Pacific Northwest as the basis for understanding visitor requirements, enriching recreation experiences, lessening user-resource conflicts, and aiding resource management.
- (4) Approaches and criteria for forest landscape design and fitting landscape management to intensive resource use in California.
- (5) Measuring recreation use and trends.
- (6) Opportunities for recreation on small and industrial forest properties in the Piedmont and Coastal Plain.

Only a few years ago recreation was a minor use of the forest resource. Conflicts between uses were few and management costs were low. Today recreation and its management is big business. The overall research task is to help insure that recreation planning and management funds are used effectively and efficiently to enhance the use of America's forests and woodlands for increasing millions of recreation visitors.

Examples of Recent Accomplishments

Hazardous trees numerous on heavily used recreation sites. Many old picturesque lodgepole pines, prominent in western mountain campgrounds, are defective. A study of five Sierra Nevada campsites showed that one-third of all the trees had butt rot, and one-half of these were rated potentially hazardous to recreationists. Furthermore, potential hazard increased as much as three and four times on heavily used sites. Fire scars were the most common abnormality associated with decay and hazard. Lodgepole pines must be carefully inspected in recreation areas where trees are fire scarred, often overmature, and exempt from commercial cutting.

Fertilizers and irrigation help maintain heavily used recreation sites. A Utah study showed that fertilization increased the vigor of campground vegetation, especially if nutrients that were previously lacking were supplied. Trees were helped when fertilizer was placed in holes drilled in the soil at the root zone.

Broadcast spreading of fertilizer aided ground cover plants more than trees. Timing of watering was very important. Watering just before heavy use softened soils, made vegetation turgid, and increased the possibility of damage. Watering after heavy use, however, aided survival by keeping bruised vegetation moist until it had a chance to heal.

Boundary Waters Canoe Area--a problem of maintaining aesthetic values with heavy use. Minnesota's Boundary Waters Canoe Area sustained 250,000 visits in 1965, and more are expected each year. The area's soils are thin and fragile. Even lightly used campsites have lost 50 to 99% of their ground cover. Tree reproduction on these sites is absent; erosion, compaction, and root exposure are prevalent. Canoeists do not realize they are unintentionally damaging the camping sites. Educational programs are needed. Outfitters who rent canoes, tents, and supplies also can help by suggesting travel routes that effect better distribution of users.

Visitors helpful in planning visitor information programs. Most campers on lower Michigan National Forests were family groups staying about five days. This suggested the need for variety in visitor information programs from day to day, but not between weeks. Programs must be directed to the interests of both children and adults. The opportunity and need to inform adults is not met by pointing all information programs at a child's level of understanding, but one answer is to aim daytime presentations at children and night presentations at adults.

Who are the customers for privately owned campgrounds? Profitable private campground operation depends upon:

- (1) How well the entrepreneur anticipates the facilities and services wanted by campers.
- (2) How well he estimates his potential market.
- (3) How well he understands the kinds of campers he hopes to serve.

Private forest campground users in the Ohio River Valley generally camp as family groups. For many, this was their first year of camping. The majority came from urban areas. Families camping out for just a weekend usually camped with another family. They participated in several other outdoor activities, traveled less than 100 miles to the campground, and used either a travel trailer or tent trailer. Families camping while on a major vacation tended to camp alone. They participated in very few other outdoor activities, often traveled more than 100 miles to the campground, and used a tent more often than any other type of shelter. These vacationers were more interested in conveniences such as showers and laundry facilities than were the weekenders.

	1966	1967	1968	Increase
FOREST FIRE RESEARCH	\$2,860,000:	\$2,912,000:	\$3,112,000:	+\$200,000:

An increase of \$200,000 is needed to intensify research on:

- (1) An electronic fire detection system utilizing an airborne infrared scanner and a telemetering link to provide fast, accurate fire information to forest fire control centers.
- (2) New fire control technology to reduce forest fire losses in the eastern United States.
- (3) Improved technology for reducing fire hazards in northwestern forests with special attention to methods which reduce air pollution in logging slash disposal operations.

Forest fire research develops methods and systems for both wildfire control and intentional use of fire in land management. It also develops basic knowledge needed to protect resources adequately from forest fires. The program includes investigations of fire physics and chemistry, atmospheric conditions that affect forest fire combustion rates, fuels and fire behavior, and fire prevention. Those phases of research requiring highly sophisticated equipment and techniques are conducted at three forest fire laboratories: Missoula, Montana; Macon, Georgia; and Riverside, California. Specialized field studies are conducted at seven other locations.

Every five minutes someone is guilty of starting a forest fire somewhere in the United States. Each year Federal, State and private forest protection agencies spend more than \$150 million to fight some 100,000 forest fires.

The forest fire problem is becoming increasingly complex as summer homes, suburban developments, and extensive plantations intermingle with wild forest lands. Traditional firefighting methods are no longer adequate to protect the vastly increased values at stake. Much progress has already been made in developing new and improved fire control methods, such as aerially delivered fire retardant chemicals. More research is needed if forest fire control is to take advantage of several technological advances. For example, recent improvements in helicopter performance open up possibilities for radically new initial attack systems. Advances in computer technology make automated fire danger rating and dispatching systems potentially feasible. Cost effectiveness studies show that past investments in forest fire research have paid off at better than 13 to 1 in reduced costs and losses.

Examples of Recent Accomplishments

Fewer lightning strokes come from seeded clouds. Research aimed at modifying lightning storms showed that storms heavily seeded with silver iodide produced one-third fewer cloud-to-ground lightning strokes than did untreated storms (Figure 20). Success in lightning prevention depends on seeding particular cloud forms with specific amounts of silver iodide at just the right time. Further research to develop operational cloud seeding techniques may prevent 2,000 to 3,000 lightning fires annually.

Fire prevention studies have paid off. A fire prevention study in northern California identified a small segment of the population that caused a disproportionately large number of fires. They were younger rural residents, both male and female, with part-time jobs. They had very little knowledge about the fire problem and no strong feelings one way or the other about fire prevention. On the basis of these findings the State of California is increasing its expenditures on fire prevention contacts with this high risk group and greatly reducing its expenditures on the other 90% of the population. The result will be a savings of \$2 million annually and a potential increase in prevention effectiveness.

Airborne infrared fire detections are technically feasible. Forest fire research scientists have recently designed an improved high resolution infrared scanner capable of detecting small heat sources from high flying aircraft. This instrument has now been test flown over all of the major forest types in the United States, including Alaska. This was done to determine the possible extent to which different kinds and densities of forest canopies might limit the scanner capabilities for detecting small fires on the ground. Performance was found to be adequate in all instances during both day and night operations. These basic findings now open the way for the more extensive job of developing operational fire detection systems based on optimum combinations of ground-based visual detectors and airborne infrared scanners. The objectives are to:

- (1) Extend the needed area of detection coverage beyond that possible with ground detectors.
- (2) Replace visual detection in critical areas when visibility is reduced by smoke or haze. Accuracy of fire location as well as speed of detection is an essential criterion.

Choosing the right fire retardant can reduce costs. The number of available forest firefighting chemicals has multiplied rapidly, and fire control managers and dispatchers are often confused about what type to use. Studies at the fire laboratories have determined the relative effectiveness of fire retardants according to temperature-humidity-wind conditions, the amount of chemical applied to the fuel bed, and the length of time the retardant must remain effective. Using these guidelines, fire dispatchers can specify the type of chemical required for use on a particular fire by either fixed wing aircraft or helicopters. About 16 million gallons of fire retardant chemicals are used every year by forest fire control agencies. Retardant chemicals vary in price from less than 1¢ per gallon to more than 16¢ per gallon, and significant cost savings can be achieved by fitting the proper chemical to each fire need.

Long duration strokes (left) start fires.
Short duration or cloud-to-cloud strokes (right) do not.



Special generators have been developed
for lightning prevention cloud seeding.

The seeded cloud in the center
is dissipating and no longer
poses a lightning threat.



	1966	1967	1968	Increase
FOREST INSECT RESEARCH	\$3,856,000	\$3,998,000	\$4,103,000	+\$105,000

An increase of \$105,000 is needed for strengthening research on bark beetles and defoliators. Bark beetles are the most destructive group of forest insects in the United States and a part of the increase would be used for on-going studies in the South and West to find out how to reduce heavy annual losses which they cause. This would permit greater emphasis on biological and ecological studies. Followup on new leads in biological control, development of trees resistant to bark beetles, sex lures, male sterilization, and more effective chemical control techniques would also be possible.

Some of the increase would be used for high priority research on defoliating insects in the West, Lake States, and Northeast. The spruce budworm, a typical serious defoliator of forest trees, would receive the most attention. Better chemical control of the budworm is the subject of an intensive research program currently underway; however, alternative approaches such as biological control, control through forest management, and new techniques such as male sterilization also need added investigation.

Forest Service insect research is aimed at the prevention and control of insect-caused losses. Control through indirect means offers the best long-run approach. Major emphasis in the research program is being given to the use of insect parasites, predators, and diseases; silvicultural practices designed to prevent insect outbreaks; attractants; and male sterilization techniques. Investigations on direct control methods seek safer and less persistent insecticides, tailored to kill the pest insects and to have a minimum impact on other elements of the environment.

Examples of Recent Accomplishments

Bark beetle sex attractant synthesized. The sex attractant for the bark beetle, *Ips confusus*, isolated and identified last year, has recently been synthesized in the laboratory. Researchers at the University of California and Stanford Research Institute, working together under Forest Service grants, produced the material and proved its attractiveness. The synthetic attractant is as effective in luring the beetles as is the natural material produced by the male beetles. This is a major step toward attracting destructive bark beetles into places where they may be sterilized, poisoned or otherwise destroyed.

Parasites established to help control Dutch elm disease. Dutch elm disease, the most serious pest of American elms, is transmitted from infested to healthy trees by bark beetles. The only practical way to control the disease is to control the beetles. Insecticides while effective are expensive, and some have undesirable side effects. A species of parasitic wasp was recently introduced from Europe as a biological control for the beetles that spread the disease. The parasite appears to be well established and, if successful, will effectively augment present chemical controls or actually replace them.

Larch casebearer parasites established in Northwest. The larch casebearer, an insect accidentally introduced into the eastern United States from Europe, has spread as far west as northeastern Washington. It is a serious pest of larch trees, and its control with chemicals is not practicable. A parasite of the casebearer, introduced from Europe, now appears to be well established. Entomologists believe that it will aid in checking the casebearer's westward spread. (See Figure 21, top.)

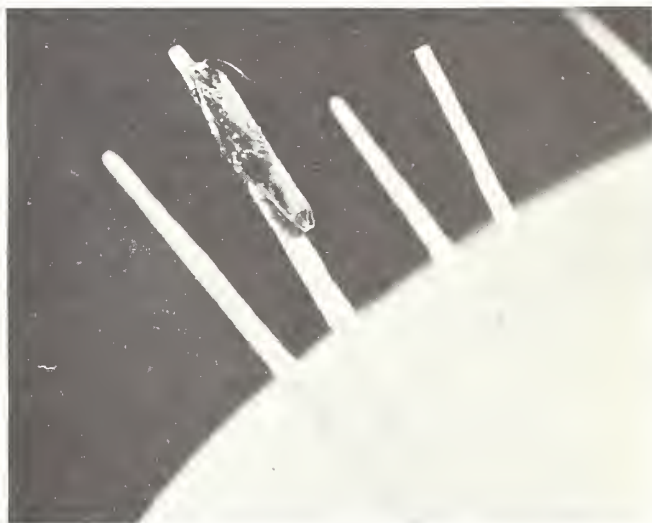
Habits of wood-boring insects revealed. In the West large volumes of fire-killed and windthrown timber are salvaged. Often logs from such timber are attacked by insects before they are removed from the woods. The offspring of the attacking insects develop in the wood after the trees are manufactured into lumber, and they emerge after the lumber has been used in construction. The insects bore through wallboard, expensive interior paneling, wallpaper or roofing. The result: costly repair bills for the building owner. Work underway in California revealed details of the life histories and habits of many of these wood borers. This information points to control techniques that will limit the activities of these insects and minimize the damage they cause.

Mass produced European pine shoot moth. Cooperative studies between the Forest Service and Washington State University developed techniques for rearing and sterilizing large numbers of male European pine shoot moths. A novel "dummy tree" was designed to help get moths to mate and produce eggs under laboratory conditions. (See Figure 21, center and bottom.) These eggs are required for a mass rearing program essential to developing a new control technique.

Breeding strains of more potent insect pathogens. Use of disease organisms is one of the promising new approaches to control of destructive insects. However, microbial control of most pests has not progressed as rapidly as had been hoped for. The causes for some of these difficulties have been identified in the case of certain forest insects. Researchers have discovered that foliage of some kinds of trees contains toxic substances for certain pathogens. For example, a substance in Douglas-fir foliage inhibits the effectiveness of Bacillus thuringiensis, a potentially highly effective microbial insecticide. Research shows that we can increase the virulence of the bacillus by developing strains that will resist these anti-bacterial substances. Advances like this may lead to insect control without the use of chemicals.



BIOLOGICAL CONTROL - Parasitic wasps imported from Europe are released in the forest to help control tree-killing insects.



AUTOCIDAL CONTROL - European pine shoot moths respond to dummy pine needles (toothpicks in plastic foam) where they lay eggs used in producing offspring needed to develop sterile male control techniques.



:	:	:	:	:	:
:	1966	1967	1968	Increase	:
:	:	:	:	:	:
:FOREST DISEASE RESEARCH ...	\$2,081,000:	\$2,171,000:	\$2,358,000:	+\$187,000:	:
:	:	:	:	:	:

An increase of \$187,000 is needed to:

- (1) Strengthen research underway to develop more effective preventive and control measures for diseases killing and injuring trees in shelterbelts, outdoor recreation areas, and forest stands.
- (2) Speed up research to develop biological control organisms and genetic host resistance for major diseases of forest trees.

The increase would be used to:

- (1) Strengthen research on the control of diseases of shelterbelt trees in the Great Plains.
- (2) Develop controls for diseases affecting the utility of outdoor recreation areas and roadside trees in the Southwest, Northwest, Rocky Mountains, North Central and Northeastern States.
- (3) Accelerate research on the control of pine and aspen cankers reducing the productivity of pulpwood stands in the North Central States.
- (4) Support research underway on the diebacks and declines of hardwood trees in the Northeast.

The disease research program will be strengthened in California, Oregon, Idaho, New Mexico, Colorado, Nebraska, Minnesota, Michigan, Ohio, and Connecticut.

Diseases kill and deform trees, discolor foliage, retard growth rate, reduce quality of product, delay regeneration, cause heart rots, and destroy wood in processing and use. They reduce the utility of trees for timber production, for game habitat and food, and for outdoor beauty and social amenities. Annual disease losses to wood production alone are estimated at 20 billion board feet, worth \$200 million on the stump and several billion dollars after manufacture. It is the equivalent of enough lumber to build 2 million 5-room houses. Disease losses to other values equal or exceed timber losses.

The objective of disease research is to provide the information needed to maintain and enhance forest land productivity. Research needs increase with intensive management and with environmental changes such as air pollution, droughts, warming climatic trends, and greater public use. Past research has sharply curtailed losses in nursery seedling diseases, heart rots, stem rusts, and dwarf-mistletoes. It has developed measures to prevent stain in green lumber and to lessen decay in wooden structures. These successes indicate that a greater effort can solve today's magnified disease problems.

Examples of Recent Accomplishments

Beneficial fungi on tree roots produce antibiotics. In the Southeast, a beneficial root fungus produced a compound new to science. It is a potent antibiotic and protects tree roots from infection by soil organisms. At 50 to 70 parts per billion concentration it inhibits a virulent root pathogen, Phytophthora cinnamomi, the cause of the littleleaf disease of shortleaf pine. Another beneficial tree-root fungus produced a different antibiotic found to be more potent against human pathogenic bacteria than commercially available antibiotics. High priority is being given to studies of the usefulness of these antibiotics in controlling diseases of plants, animals, and man (Figure 22, top).

Toxic substance may be secret of rapid kill by oak wilt fungus. Oak wilt kills mature oaks in a few weeks after infection, possibly through the action of a powerful toxin it produces in minute amounts. This compound has been partially purified and is now under study to determine its nature and mode of action. This research may indicate a new approach to oak wilt control through toxin inactivation. (See Figure 22, center.)

Cut pines in hot weather to reduce root rot infections. Infection of freshly-cut slash pine stumps in south Georgia by the annosus root rot fungus is least from March through September. During this period stump top temperatures reach or exceed 104°F. on several consecutive days. To the extent possible, thinning and harvest cuts should be made during these months.

Site factors indicate hazard from annosus root rot. Southern pine plantations with severe annosus root rot infections have less organic matter, more sand or clay, a higher soil pH, and less grass than stands with no detectable infection. Analysis of these factors may permit classification of plantation sites by hazard classes and selection of low-risk areas for planting--an excellent disease prevention measure. In addition, infection hazard may be reduced on high-hazard areas by prescribed burning before thinning to reduce organic litter on the soil.

Effective controls developed for two Great Plains tree diseases. Phomopsis blight of eastern redcedar and Dothistroma blight of Austrian and ponderosa pines are two of the most destructive tree diseases in the Great Plains. Phomopsis blight commonly infects seedlings in nursery beds but rarely occurs on older trees in windbreaks and shelterbelts. Nursery infections can be prevented by weekly applications of a fungicide from May to September, thereby providing disease-free seedlings for outplanting. Dothistroma blight causes defoliation and death of older pines in established windbreak, shelterbelt, and Christmas tree plantings. Two applications per year of a fungicide prevent infection and subsequent losses.

Soil fumigation controls diseases in California forest nurseries. Sugar pine seedling losses in California nurseries averaged 50% in recent years. Soil fumigation prior to sowing has cut these losses to less than 10%, and at the same time it has increased seed germination and seedling vigor. Also fumigation has reduced nursery weeding costs, improved survival of seedlings after outplanting, and lessened the chances of introducing new diseases into outplanting sites (Figure 22, bottom).

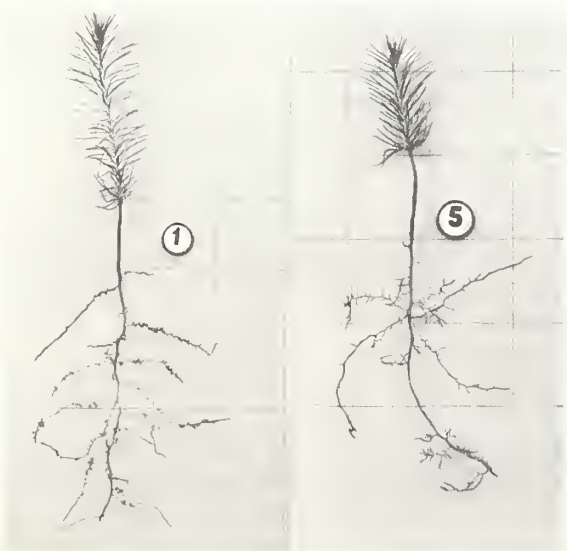
Dwarfmistletoe infection directly related to tree size and age. Understory red firs in dwarfmistletoe-infested stands in California are essentially free of infection up to a height of 3' and an age of 20 years. By the time they are 10' tall and up to 50 years of age, over 50% are infected and worthless as potential crop trees. Thinning or harvest cuts in dwarfmistletoe-infested stands should be scheduled before advance regeneration is more than 3' tall. In all such operations infected overstory trees should be removed to prevent subsequent infestation of the young stand.



Beneficial root fungus
(edge) inhibits root
pathogen (center)



Red oak
cuttings
treated with
toxin (right) ,
untreated
(left)



Sugar pine seedlings
grown in fumigated
soil (left) , in
untreated soil
(right)

:	:	:	:	:	:
:	1966	1967	1968	Increase	:
:	:	:	:	:	:
FOREST PRODUCTS UTILIZATION	:	:	:	:	:
RESEARCH	\$6,077,000	\$6,493,000	\$6,863,000	+\$370,000	:
:	:	:	:	:	:

An increase of \$370,000 is needed primarily at Madison, Wisconsin, to hasten solution of critical utilization problems. Included is expansion and acceleration of wood fiber products and related chemical research. Emphasis will be given to new pulping processes aimed at higher yields and broader utilization of low-quality timber. The increase also will accelerate research on the efficiency of existing methods for nondestructive evaluation of wood and wood-base materials. It will expand research to seek new and more effective inter-property relations and to develop basic data needed for more efficient industrial and structural utilization of wood, including broadened and accelerated studies of wood conversion systems and the development of models for evaluating alternative processes.

Forest products utilization research is aimed at providing a sound basis for:

- (1) Maximum possible contribution of the forest products industries to the Nation's economy.
- (2) Maintenance of industrial stability and healthy development within the industry.
- (3) Improved resource conservation through wise use.

The timber-using industries of the United States employ about 3.3 million people and annually contribute about \$25 billion to the gross national product. With an adequate forest products utilization research effort, it is estimated that an annual growth rate of about 7.5% is attainable in the forest products industries. Thus, with the aid of research the industry's contribution to the gross national product can be increased by as much as \$2 billion next year. Despite its large size and impressive economic contributions, a major characteristic of the forest products industry is its fragmentation into many thousands of small manufacturing units, many in rural and depressed areas. The vast majority of these are not able to conduct private research that can improve their competitive position with more advanced industries.

Past Forest Service research on wood and related products area has played a major part in strengthening the industry's position. For example, about \$50,000 worth of research specific to the use of southern yellow pine for manufacture of plywood had a major bearing on the current explosion in southern pine plywood industry. In 1964 the first three plants built represented an annual product value of \$6 million. In 1966 the plants totaled 30, with product value of \$90 million, and they had created 5,200 jobs. Similarly, about \$600,000 expended on research involved in the development of the neutral sulfite semichemical pulping process made possible greatly broadened use of hardwood timber for pulp and paper. The market value of the 3 million tons of pulp now produced annually by this process is estimated at over \$1 billion.

Examples of Recent Accomplishments

Determining multiproduct potential in standing timber. There is a need to estimate potential value of timber for products other than lumber; e.g., poles, pulpwood, or veneer. A promising inventory technique has been developed for determining suitability and potential yields for multiproducts. Subjective estimates by field men are eliminated. Data on basic tree characteristics can be reanalyzed to meet any one of several inventory needs. Resource management agencies will save money and manpower by:

- (1) Making maximum use of a single set of data.
- (2) Eliminating need for reinventories.

Wood-stringer bridges. Laboratory and field studies of forest-road bridges led to a recommendation for change in design criteria to the American Association of State Highway Officials. For maximum efficiency and economy interior stringer sizes may be reduced without changing existing design criteria for outside stringers. A saving of 25% in the volume of bridge timbers is possible where shear is the limiting factor.

Pulpwood chip storage. Production of pulp chips from sawmill and veneer mill residues has increased rapidly in recent years. In 1963 it amounted to about 11 million cords, or 24% of all pulpwood consumed at United States mills in that year. Economic advantages in the transport, storage, and handling of chips in comparison to roundwood are attractive if pulp yields and quality are not sacrificed during chip storage. In kraft pulping, pile storage of pine chips presents no problem except for some loss in yield of tall oil and turpentine. However, hardwood chips show different reactions. In maple, birch, and beech chip piles the common wood rotting fungi find satisfactory growth conditions in the cooler portions of the pile. They cause loss in wood substance, loss of wood extractives, and discoloration of the chips. Hence, a definite decrease was found in sulfite pulp yield and in pulp brightness. Now, with the problem identified further research to control the fungi or to minimize their harmful effects will be feasible.

Ceiling tile with unique acoustical properties. Wood chips can now be made into attractive ceiling tile with unique acoustical properties. (See Figure 23.) The random alignment of the 5/8" chips creates a rough surface. Sound is absorbed regardless of the frequency of the sound waves. In this respect the material differs from many conventional sound-insulating materials which absorb the higher frequencies most effectively. The board-type ceiling tile is easily made in a typical press. Designed to span supports 2' apart, the 2- by 4-foot panels are 3/4" thick. One surface is sanded and painted with a flat, interior paint. Panels retain their rigidity in damp and humid areas.

Flashover of combustible gases. New insight into how fire progresses in buildings may have a strong bearing on the acceptability of wood and other combustible materials. Heretofore, the sudden leaping of flames, called "flashover", was thought to be spontaneous ignition of combustibles with rising temperatures. Current evidence is that fire progresses by flashovers as hot combustible gases reach new sources of oxygen, regardless of the combustibility of wall and floor covering materials.

Yield of clear-cuttings from hardwood lumber grades. A new computerized system eliminates the guesswork in maple lumber procurement by the wood fabricating industry. For each order, some combination of grades leads to the most efficient and profitable utilization of lumber. The computer calculates the lumber grades to purchase for a given set of cuttings, and instructs whether to rip or crosscut first.

Lignin formation. Laboratory experiments were successful in duplicating nature's process by which the living tree uses simple chemical compounds derived from the soil and air to produce lignin, the complex compound that binds wood cells together. These experiments contributed greatly to further understanding the nature and behavior of lignin as it exists in the living tree. They added another stepping stone to improve pulping techniques, better solutions to the waste problem, and new uses of this abundant product of nature.

Heat conduction values of wood-base panel products. As new wood-base building materials are developed, a key property important to their acceptance is thermal conductivity, or insulating value. Research to establish basic values for typical panel products has been completed, and the results will be included in industry's engineering guides, now being revised.

Paneling and flooring from low-grade hardwood logs. Wood cut from small, low-grade red oak logs can now be press-dried in a few hours by a process that greatly enhances color and appearance. This new drying system uses the concept of going directly from logs to products instead of first sawing lumber that must later be remanufactured. Low-quality wood with knots and other defects can be used for paneling and flooring. No installation allowance for shrinkage is necessary, and side- and end-matched panels and flooring can be installed with only a few carpenter's tools. This product can be made in the Northeast, North Central, and Appalachian regions where vast quantities of little-used hardwood timber are available. The processing technique eliminates costly steps in production, reduces waste, utilizes local machines and labor, and provides an attractive product from low-quality logs. An increase in product value at the mill of from \$5 to \$15 per MBF of logs over present conventional products can be expected.



Section of ceiling tile made of wood chips, having improved rigidity and superior acoustical properties.

	1966	1967	1968	Increase
FOREST ENGINEERING RESEARCH	\$416,000	\$583,000	\$798,000	+\$215,000

An increase of \$215,000 is needed to expand and accelerate research on:

- (1) Aerial logging systems using balloon and skylines for timber areas having difficult access or operational conflicts with recreation, water, and other multiple use values.
- (2) Fully mechanized, production line pulpwood harvesting systems to meet vastly increased productivity requirements.
- (3) Harvesting equipment, machines, and tools to meet the specialized needs of small timberland operators.

Forestry operations have not kept pace with other basic industries in improving labor output, in mechanization and automation for improved efficiency, and in reducing the physical drudgery involved. The production process is faced with increasing restrictions due to competing forest interests such as recreation, water, wildlife, and livestock which tend to increase already high costs. Because forest industries are decentralized, only small studies have been made leading to piecemeal improvements. Relatively little systematic research has been conducted of the kind required to reach essential major goals--giant steps in cost reduction and improvement of forestry operations, working conditions, and safety. Radical breakthroughs in mechanization of harvesting systems are urgently needed to raise productivity and to maintain and increase raw material supplies at competitive prices.

The engineering research program is prepared to make rapid advances toward solution of harvesting and production problems. Foreseeable benefits include:

- (1) At least a 20% reduction in costs of harvesting the Nation's timber crop at an annual saving of \$320 million.
- (2) Capture of 500 million board feet of annual allowable cut now lost on timberlands not loggable in the Douglas-fir region of the West.
- (3) Capture of an additional 440 million board feet of annual allowable cut in Alaska on National Forest areas that cannot be logged by conventional methods.
- (4) A \$16.5 million saving annually from reduction in mileage of timber-haul roads by use of aerial logging systems in National Forests of the Douglas-fir subregion of the West.

- (5) A 10% reduction in costs of regenerating intensively managed forests in the South.
- (6) A 10% reduction in the costs of harvesting gum naval stores.
- (7) A significant reduction in the logging accident frequency rate--one of the highest in industry.

Examples of Recent Accomplishments

Cutting characteristics of chain saw teeth. Detailed study of a chain saw tooth cutting through green timber has resulted in a research breakthrough. The forces and energy consumed during cutting were measured. Improved design of chain saw teeth and other cutting devices are now possible. Potential annual savings to the logging industry through a 10% improvement in chain saw parts replacement and cost of maintenance is estimated at \$1,850,000.

Design system for aerial cableways. Analyses of aerial logging cableway operations indicated a need for an easily applied method of designing and operating single and multispan skylines. Such a method has been devised and results presented in a "Skyline Logging Handbook on Wire Rope Tensions and Deflections." Availability of the Handbook should result in more efficient and safer skylines. More use of aerial systems so urgently needed to gain difficult access and to protect watershed and aesthetic values is anticipated. It represents an important step in realizing the multimillion dollar annual benefits to be realized from reduced road mileages and added timber supplies.

	1966	1967	1968	Increase
FOREST SURVEY	\$1,939,000	\$2,100,000	\$2,203,000	+\$103,000

An increase of \$103,000 is needed to:

- (1) Accelerate timber inventories.
- (2) Provide more local information on industrial development opportunities.
- (3) Strengthen appraisals of timber supply and demand.

The proposed increase would permit reinventories of each State on an average cycle of ten years. Periodic local and national appraisals provide a basis for judging the costs, benefits, and justifications of both public and private forestry programs. The survey would be strengthened in all regions, particularly in the South and the North. Forestry conditions are changing rapidly in these regions. Rapid industrial expansion is underway, and there are major questions as to size of present and future programs.

The forest survey provides continuing appraisals of the timber supply and demand situation and outlook in each State and the Nation. Periodic inventories furnish basic statistics on:

- (1) Area and condition of forest lands.
- (2) Volume and quality of standing timber.
- (3) Rates of timber growth and mortality.
- (4) Cut of timber for industrial use.
- (5) Trends in ownership.

Knowledge of present and future timber supplies is of critical importance in judging the adequacy of existing forest policies and programs. Specifically, survey information is needed to evaluate and justify public appropriations and private investments to meet expanding demands for timber products. Federal and State forestry agencies rely on the survey to guide program planning and budgeting. Forest industries rely on the survey for resource information essential for business decisions relating to wood procurement, land management, and industrial expansion.

Examples of Recent Accomplishments

Continuing progress on State surveys. During the past year field inventories of timber resources and industrial use of timber were completed on approximately 49 million acres of forest land in ten States--Alaska, Oregon, California, Montana, Michigan, Kentucky, Pennsylvania, Virginia, Mississippi, and Texas. Reports appraising the timber situation were issued for eight States or portions of States.

New comprehensive appraisal of the timber situation completed for the Pacific Northwest. Forest lands of Washington, Oregon, Idaho, and western Montana contain 1,123 billion board feet of sawtimber--about 44% of the United States supply. Timber industries produce about 51% of the Nation's lumber, 87% of the softwood plywood, and 25% of the wood pulp. Projections of prospective timber supplies indicate that timber consumption will increase 22% by 1985. However, despite greater log production total timber-based employment is expected to decline because of continuing improvements in productivity. The prospective decline in employment is especially marked in the sawmill industry. Some increases are anticipated in other timber-based industries.

Softwood timber resources increasing in Louisiana. During the past decade growth of softwood sawtimber in Louisiana was about double the cut. The resulting buildup in softwood sawtimber volumes provided the base for a substantial expansion of timber industries. The supply of hardwoods, in contrast, is relatively unfavorable. Heavy cutting and land clearing have reduced the total volume of hardwood sawtimber by 23% during the past decade.

First comprehensive survey of Utah completed. The first survey of Utah's forests reveals a volume of 19.5 billion board feet of sawtimber, including a considerable amount of overmature timber. Current harvesting of this timber resource is considerably below the allowable cut. Management of the forest in this area for timber must take into account the fragility of soils, low values for timber, and the major importance of water, recreation, and forage uses.

	1966	1967	1968	Increase
FOREST PRODUCTS MARKETING				
RESEARCH	\$1,491,000	\$1,625,000	\$1,625,000	- -

No program increase is proposed.

Marketing research includes studies of problems relating to consumption of wood products in construction, manufacturing, and shipping. Of particular importance is the evaluation of factors that influence use of wood products and competing materials in various markets. Methods to expand use of wood products also have major importance. These studies provide guidelines for adjustments of production and marketing practices within forest industries. They also provide a basis for appraising the Nation's timber supply and demand situation and outlook. Such evaluations of timber market prospects are essential for program planning and budgeting. Improvements in markets for wood products will increase returns to millions of forest landowners, operators of wood-using plants, and their employees. These increases in turn will benefit economies of rural areas that have timber resources.

Examples of Recent Accomplishments

Operations research shows way to higher sawmill profits. Linear programing studies at a modern southern pine sawmill showed managers how to saw each class of logs for maximum net returns. Decisions must be based on:

- (1) Amount, quality, and cost of logs.
- (2) Possible sawing patterns and their yields.
- (3) Time available on each piece of mill equipment.
- (4) Structure of market prices.

Sawing each class of logs by its optimum sawing pattern yielded \$1,647 per hour in total revenue above the cost of raw material. This revenue was derived from lumber, timbers, and chips. The analysis further showed how changes in operating procedures changed optimum sawing patterns for various classes of logs.

Reduction of logging costs possible through better management. An analysis of costs and returns on logging operations in southeast Kentucky showed a cost distribution of 29% for stumpage, 31% for labor, and 40% for equipment. Total costs per thousand board feet amounted to \$35.82. Profits amounted to 10.5% of receipts. Better planning and supervision of the logging could have resulted in a 25% increase in production and a doubling of the margin for profit and risk.

Standard hardwood log grades benefit buyers and sellers. Local log grading systems at five Appalachian hardwood sawmills misclassified the quality of 42% of the volume in 1,164 sample logs. As a result operators underpaid suppliers for some of the logs purchased and overpaid others. Average net returns at the five sample mills could have been increased nearly \$4 per thousand board feet by using the more accurate standard Forest Service log grades. Data taken at 13 sample mills indicate that the Forest Service log-grading system can be readily applied by the log scaler at an average cost of less than 30¢ per thousand board feet of logs.

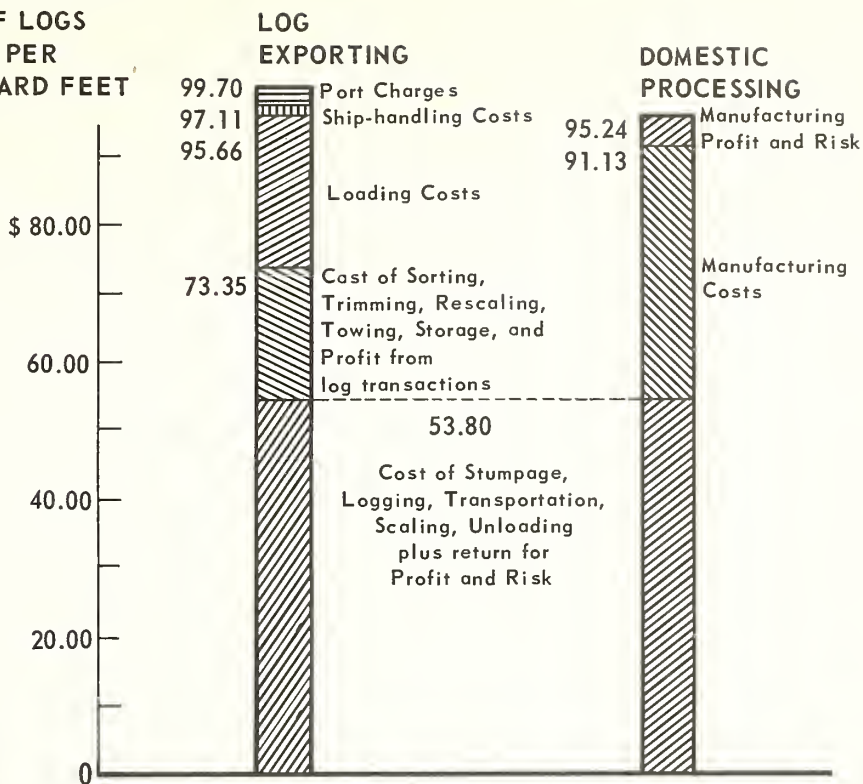
Tomorrow's crosstie--wood or concrete. Consumption of crossties dropped from over 48 million ties annually during the 1940's to 14.5 million ties in 1961, but consumption has risen sharply to a current level of about 20 million ties. Current demands cannot be met at conventional prices because many sawmills that formerly produced crossties have ceased operation or have shifted to other products. The shortage of wood crossties has encouraged testing of concrete ties in a number of tracks. Concrete ties probably will penetrate this market. Therefore, we are determining possibilities for more efficient and profitable production of crossties. The practicability of using new designs of solid wood or laminated ties is also being investigated.

Log exports and the Pacific Northwest economy. The average value of logs loaded aboard ship and ready for export to Japan was \$99.70 (Figure 26, top). The average value of the products that could have been obtained through domestic processing of the same logs was estimated at \$95.24. Domestic processing of these logs into kiln-dried lumber would have generated approximately nine man-hours of employment per thousand board feet. This compares with about three man-hours of domestic employment in log exporting. More than 90% of recent log exports consisted of No. 2 and 3 sawlogs, and less than 4% were peeler and select grade logs. Over 80% of the logs exported were under 22" in diameter, and more than 75% were low-value hemlock and white fir.

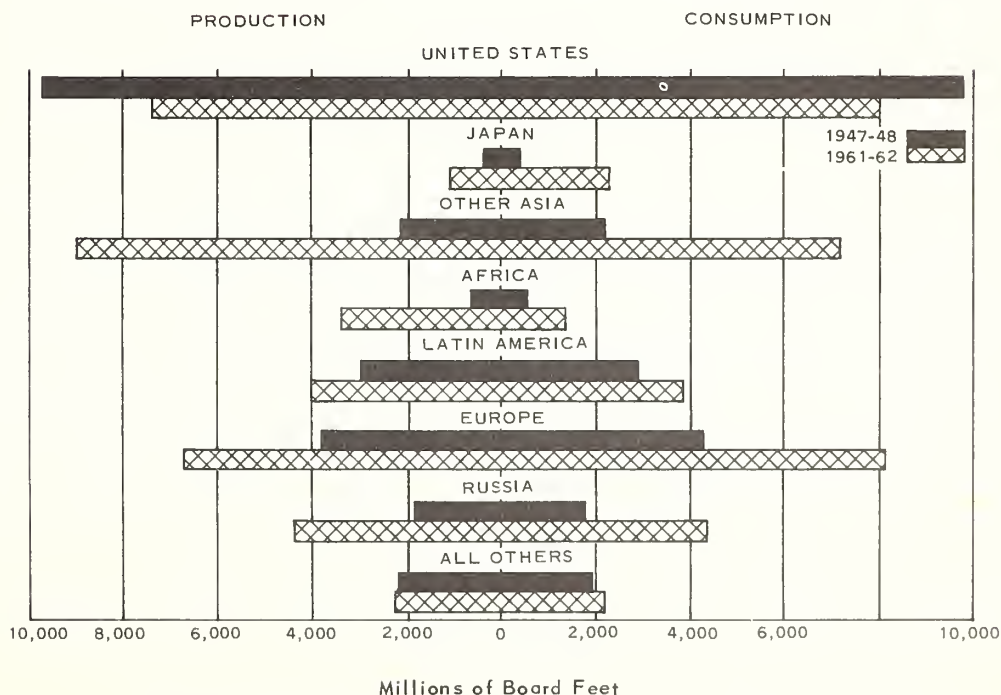
Promising opportunities for pulp and paper production in Illinois. A substantial potential exists for new pulp and paper plants in southern Illinois. Available timber supplies could sustain additions to pulping capacity of up to 2,500 tons per day. Water supplies are adequate for most pulping processes; transportation facilities are favorable; and labor, power, and other factors are available at reasonable cost.

United States hardwood imports grow. During the past 15 years imports of hardwood plywood increased forty-fold to 60% of total United States consumption. Imports of hardwood lumber from tropical countries and Canada also increased to about 5% of the United States market. Analysis of domestic markets and timber supplies indicates that the major reason for increasing imports has been a growing shortage of high-quality hardwoods. A rapid expansion in production of fine hardwoods in tropical areas of the world has been another contributing factor. These trends appear likely to continue, and increases in imports of hardwood plywood and lumber are to be expected in coming decades (Figure 26, bottom).

**AVERAGE VALUE
OF LOGS
PER
M BOARD FEET**



Value of the export log sample in alternative log markets, Washington and Oregon, October to December 1964.



Hardwood production and consumption has expanded in world areas other than the U.S.

	1966	1967	1968	Increase
FOREST ECONOMICS	\$658,000	\$791,000	\$1,088,000	+\$297,000

An increase of \$297,000 is needed to:

- (1) Evaluate the costs and benefits of a variety of forestry investments.
- (2) Evaluate effectiveness of forestry programs for owners of small forest properties.
- (3) Develop principles and guides for planning multiple use management of forest resources.

Particular attention would be given to cost/benefit analyses of tree planting, thinning, pest control, timber salvage, and road development under different geographic conditions. Related studies would determine how forestry programs for the 4.5 million owners of private forest land could improve productivity. Special emphasis would be placed on computer oriented planning systems to increase efficiency of land management for all products and services.

Forest economics research provides guides for the investment of both public and private funds in all forestry activities. Outlays for forestry purposes have increased to several hundred million dollars annually. Efficient budgeting of these funds requires information on costs and benefits from alternative forestry programs on public and private lands. Timber growing opportunities vary widely throughout the Nation by site, forest type, ownership, market conditions, and land-use alternatives. Forest owners differ greatly in their response to forest investment opportunities and to assistance programs. Increasing pressures on forest resources and increasing competition among forest uses have intensified the need for economic evaluations to guide prudent allocation of funds to alternative forestry activities.

Examples of Recent Accomplishments

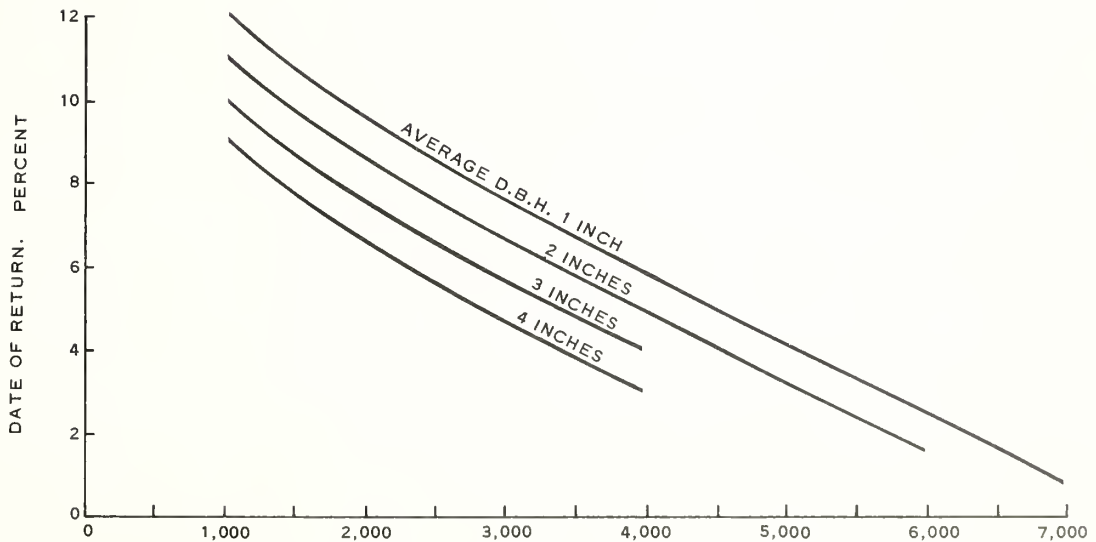
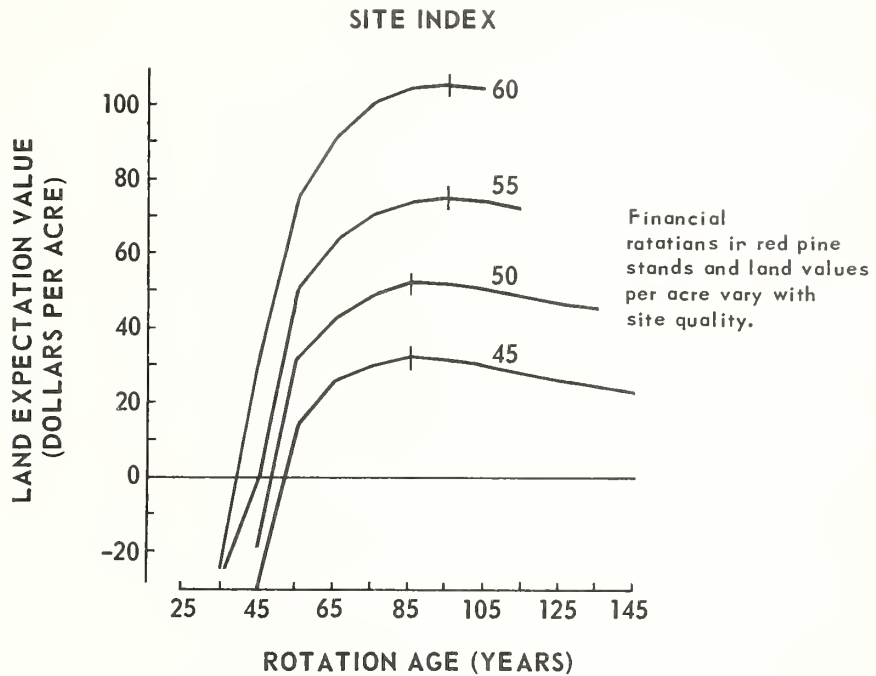
Economic guides for managing red pine stands. Under most conditions investment returns are highest if red pine stands in the Lake States are thinned regularly to 90 square feet of basal area per acre. Financial rotations also are affected by stand conditions, investment alternatives, costs, and prices. Application of these findings on the several million acres of red pine in the East would add substantially to long-run sawtimber supplies. Possible increases in timber output from improved thinning practices would also reduce costs of growing red pine by \$1 to \$2 per thousand board feet. Related studies describe how to estimate present values of incomes and costs in growing red pine trees for sale as pulpwood or sawtimber. They also illustrate how to:

- (1) Compare investment opportunities in growing red pine.
- (2) Determine the amount one can afford to buy land, establish and maintain a stand, or pay annual taxes or other expenses.
- (3) Estimate the cost of producing stumpage under specified conditions (Figure 27, top).

Economic guides for dwarfmistletoe control in the Pacific Northwest. New economic guides for dwarfmistletoe control in ponderosa pine stands provide procedures for estimating costs and rates of return from control measures. These guides were based on time and cost studies of actual control operations. They provide practicing foresters with information needed to allocate available funds among management opportunities (Figure 27, bottom).

Gauging the potential output of forest resources in Appalachia. An economic model has been developed for comparing returns from alternative investments in wood-growing on several classes of forest land. This model was applied to a part of Tennessee. Most of the forest land in this area was capable of returning 3% or more on the capital invested in forest restoration. Investments in forest restoration would increase timber production and provide employment and additional secondary benefits.

Computer-oriented systems help in allocating wildland resources. A parametric linear programming system was developed to evaluate alternate policy decisions and land-improvement programs in the Southwest. A sequence of "Management Plans" affords the decision maker the opportunity to assess effects of decisions on a predetermined economic objective. This linear program and a map information assembly and display system program previously developed can be integrated to deal with large-scale, long-term wildland management problems.



Average rate of return from investments in dwarf-mistletoe control plus precommercial thinnings varied between 2 and 12 percent, depending on number and diameter (DBH) stems which had to be removed.

Figure 27

	1966	1967	1968	Decrease
RESEARCH CONSTRUCTION	\$4,183,000	\$3,285,000	\$2,278,000	-\$1,007,000

A decrease of \$1,007,000 is proposed. The \$2,278,000 estimated for 1968 would be used for construction of facilities where plans are available and for planning other needed facilities. New construction is urgently needed to provide facilities for scientists now employed at a number of locations.

- A. Locations where plans are available and funds for construction are requested
- | | |
|-------------------------------------|-------------|
| | \$2,000,000 |
| (1) Madison, Wisconsin | \$1,300,000 |
| (2) Albuquerque, New Mexico | 700,000 |
| (1) <u>Madison, Wisconsin</u> | \$1,300,000 |

Plans and specifications are available for a new Wood Chemistry Building to expand facilities at the Forest Products Laboratory. Due to high costs, this building could not be constructed with funds appropriated by the Congress in fiscal year 1965. This building is urgently needed to provide modern specialized facilities for wood chemistry and wood fiber products research. These activities must be moved from the old laboratory during its remodeling and renovation now being planned with funds appropriated in fiscal year 1967. The Senate Appropriation Committee urged "the Forest Service to consider carefully the inclusion of funds for construction of this building in the fiscal year 1968 budget." As noted by the Senate: "This facility is essential to progress in the control of air and water pollution from pulp and paper manufacture."

- | | |
|--|-----------|
| (2) <u>Albuquerque, New Mexico</u> | \$700,000 |
|--|-----------|

In fiscal year 1965 Congress provided funds for design and plans which will be available, so construction can proceed in fiscal year 1968. The Forestry Sciences Laboratory will provide modern equipment for research on the management and rehabilitation of eroded forests and range watersheds and on the ecology, biology and control of forest insects and diseases in the Southwest. The University of New Mexico has provided a site on the campus.

Locations where funds for architectural and engineering planning are requested \$278,000

- (1) Moscow, Idaho \$45,000
- (2) Research Triangle, North Carolina 95,000
- (3) Franklin, North Carolina 57,000
- (4) Rhinelander, Wisconsin 31,000
- (5) Gulfport, Mississippi 50,000

(1) Moscow, Idaho \$45,000

To plan second-stage construction of the Forestry Sciences Laboratory. The existing laboratory at Moscow was the first of a three-stage facility. A second-stage, estimated to cost \$600,000, is now urgently needed to provide facilities for research in the biology, ecology, and control of forest insects in the Northern Rocky Mountains, for research in the silviculture of western white pine, and associated species, and for development of blister-rust resistant strains of pines. Some of the existing research now located in inadequate quarters at scattered locations will be moved to the new facilities. The addition will also provide for urgently needed program expansion in connection with the pesticide problems. Greenhouse-headhouse facilities, for which plans are available, would be part of the construction at an additional estimated cost of \$200,000. Sufficient land is leased from the University of Idaho for all structures.

(2) Research Triangle, North Carolina \$95,000

To plan a second-stage of construction for the Forestry Sciences Laboratory. The scientific effort here in the Research Triangle Park, adjacent to Raleigh, Durham, and Chapel Hill, concentrates on basic research leading to the control of important pests of southern pines. Some of these are bark beetles, defoliating insects, root rots, and forest weed species. Expanded pesticide research at this location requires additional laboratory space. The tract of land donated to the Government by the Research Triangle can accommodate this construction. The estimated cost is \$1,200,000.

(3) Franklin, North Carolina \$57,000

To plan a Forest Hydrology Laboratory to facilitate the Coweeta watershed research program. Research at this laboratory has as its mission the improvement of quantity, quality, and timing of water yields in the southern Appalachians. Scientists investigate forest climatology, water relations of plants and soils, stream-flow and ground water. Modern facilities are required for the expanding basic and applied research programs. The laboratory and auxiliary facilities are estimated to cost \$650,000.

(4) Rhineland, Wisconsin \$31,000

To plan an expansion of existing Laboratory and greenhouse facilities at the Institute of Forest Genetics. The second-stage structure will cost an estimated \$400,000. It will relieve current over-crowding and will enable more research in the genetics of northern tree species in relation to pest resistance. The Forest Genetics Institute here is one of the three main genetics centers of the Forest Service.

(5) Gulfport, Mississippi \$50,000

To plan additional laboratory facilities for insect and disease research. The first stage of construction at Gulfport was built in fiscal year 1959. Since that time resident research programs in forest genetics, entomology, and pathology have more than doubled in size. The new laboratory would provide adequate space for scientists searching for controls for insects and diseases destructive to forest trees and wood products. The laboratory addition would release space urgently needed for genetics research in the present building. The estimated cost of second-stage construction is \$650,000. Space is available for the addition next to the present laboratory on Government-owned land.

The 1967 appropriation provided for the following non-recurring items:

Construction:

Athens, Georgia	\$1,000,000
Oxford, Mississippi	450,000
Olympia, Washington	450,000
Carbondale, Illinois	690,000

Design and specifications:

Delaware, Ohio	72,000
Corvallis, Oregon	170,000
La Grande, Oregon	28,000
Provo, Utah	37,000
Madison, Wisconsin	180,000
Nacogdoches, Texas	25,000
Berea, Kentucky	40,000
Lincoln, Nebraska	28,000
Burlington, Vermont	40,000
Durham, New Hampshire	<u>75,000</u>

Total 3,285,000

Examples of Recent Accomplishments

Construction is completed at Olustee, Florida and Sewanee, Tennessee and is underway for all other buildings provided in the 1966 appropriation. The 1967 appropriation provided for construction of laboratories at Athens, Georgia; Olympia, Washington; Carbondale, Illinois; and Oxford, Mississippi. Construction contracts will be let before the close of the fiscal year.

Plans are complete for the Wood Chemistry addition to the Forest Products Laboratory at Madison, Wisconsin and for laboratories at Albuquerque, New Mexico; Fort Myers, Florida; and State College, Mississippi. Planning of laboratories included in the 1967 appropriation is on schedule. Except for the large laboratory at Corvallis, Oregon and the remodeling at Madison, Wisconsin, detailed design and cost estimates will be available by March 1, 1967, and construction could proceed as soon as funds are available.

	1966	1967	1968	Increase
COOPERATION IN FOREST FIRE :				
CONTROL	\$12,803,000:	\$12,834,000:	\$12,834,000:	- -

No program increase is proposed.

An effective, well-equipped fire organization is needed to protect the important natural resources on State and privately owned forest lands. In fiscal year 1966, States spent \$85.1 million which included \$12.8 million of Federal funds. During the 1961-1965 period, States reported an average of 110,820 fires which burned 3,992,590 acres each year.

Emphasis on fire prevention will be continued and expanded. Fire statistics show that over 96% of all fires occurring on non-Federal lands are man-caused. State fire prevention efforts at the local level will be intensified. Included will be the employment of additional technical specialists to cope with this man-caused fire problem. Federal funds will provide the stimulus to insure effective programs.

Adequate forest fire control is especially important to the economically distressed areas as their economy is closely tied to timber, recreation, water, and wildlife resources. The greatly increased use of forested areas by loggers, homeowners, campers, hunters, hikers, and others has caused an upward trend in the number of fires.

Fire prevention and suppression strength is not now sufficient to fully utilize the newer, more expensive technical equipment and techniques. During the period 1957 to 1965 the estimated cost of protection rose from \$83 million to \$123 million. State expenditures during this same period increased from \$45 million to \$64 million while the Federal appropriation rose from \$10 million to \$12.7 million.

Similarly, timberland values have increased rapidly during the last 25 years. A conservative estimate of the value per acre of protected, commercial forest land has risen from \$5 in 1940 to \$50 in 1965. During this same period, the cost to protect these lands had experienced only a modest increase from 3.99¢ per acre to 16.12¢.

In view of the high values at stake it is essential that we be prepared to effectively meet the threats that occur during drought periods or resulting from a high incidence of fires during a short period of time. These newer, more expensive, fire control techniques are necessary to provide the insurance needed to handle catastrophic fire situations as values being protected continue to increase. Fires, if allowed to burn, not only cause an economic loss of natural resources and the enjoyment they give, but also threaten destruction of valuable watershed, road, recreation, public utility, home and other improvements valued at many hundreds of millions of dollars. In addition, the natural beauty is destroyed for generations to come.

Examples of Recent Accomplishments

All 50 States are now cooperating in the forest fire control program. Arizona became a cooperating partner on July 1, 1966.

State foresters reported extending fire protection to 25 million previously unprotected acres. At the end of calendar year 1965 there were 472 million acres protected under the Clarke-McNary Program.

The allotment and expenditure table which follows shows State fiscal year 1966 expenditures and Federal fiscal years 1966 and 1967 allotments to States. The Federal distribution to each State is based on a formula which recognizes the program need and expenditure level in each State.

COOPERATIVE FOREST FIRE CONTROLC-M 2

State	State and Private Funds Expended FY 1966	Federal Allotments FY 1966	Federal Allotments <u>1/</u> FY 1967
Alabama	\$1,177,983	\$383,890	\$370,454
Alaska	189,508	47,000	88,523
Arizona	- -	- -	21,050
Arkansas	1,381,151	394,080	377,392
California	25,458,114	1,073,080	1,035,522
Colorado	228,286	50,000	78,565
Connecticut	430,463	88,120	100,080
Delaware	14,326	14,000	15,500
Florida	4,850,341	560,968	540,912
Georgia	4,086,221	558,940	539,377
Hawaii	43,090	35,000	35,000
Idaho	532,091	213,630	207,258
Illinois	239,427	73,390	72,887
Indiana	195,072	55,950	68,408
Iowa	85,948	47,000	47,000
Kansas	266,000	47,000	92,622
Kentucky	861,987	246,090	243,128
Louisiana	2,092,477	460,400	446,286
Maine	1,089,141	323,240	307,584
Maryland	637,730	145,130	143,472
Massachusetts	865,978	148,310	153,455
Michigan	2,098,828	490,460	473,294
Minnesota	672,009	300,210	289,703
Mississippi	1,952,589	466,330	450,008
Missouri	1,020,101	318,860	304,805
Montana	354,414	154,140	149,661
Nebraska	156,512	47,000	84,502
Nevada	172,057	81,130	123,488
New Hampshire	294,349	89,740	86,599
New Jersey	610,185	144,424	159,584
New Mexico	193,027	49,500	57,342
New York	1,556,414	298,880	317,437
North Carolina	2,142,335	452,650	436,807
North Dakota	15,549	22,250	15,957
Ohio	362,328	127,870	123,395
Oklahoma	251,642	162,900	157,198
Oregon	2,907,090	526,650	506,770
Pennsylvania	1,276,478	305,700	295,000
Rhode Island	130,356	47,000	47,000
South Carolina	1,633,615	420,680	405,956
South Dakota	49,196	47,000	52,929
Tennessee	1,728,966	373,250	360,186
Texas	976,249	334,170	322,474
Utah	137,035	52,740	74,730

COOPERATIVE FOREST FIRE CONTROL-continuedC-M 2

State	State and Private Funds Expended FY 1966	Federal Allotments FY 1966	Federal Allotments <u>1/</u> FY 1967
Vermont	102,825	47,000	47,000
Virginia	1,461,904	368,920	356,008
Washington	2,815,549	539,840	520,946
West Virginia	450,631	164,664	155,703
Wisconsin	1,948,455	412,520	398,082
Wyoming	53,405	47,000	69,461
Administration, inspection, prevention and special services to States	- -	944,304	1,007,500
GRAND TOTALS	72,249,427	12,803,000	12,834,000

1/ While the amount available to a State may, if the allotment is small, exceed previously computed expenditures by that State, the actual payment to a State never exceeds State and private funds expended by or under the control of the State.

	1966	1967	1968	Increase
COOPERATION IN FOREST TREE				
PLANTING	\$300,000	\$300,000	\$300,000	- -

No program increase is proposed.

The Forest Service cooperates with 48 States and Puerto Rico through financial and technical assistance and other services in the production, acquisition, and distribution of tree planting stock for forest and windbarrier plantings on non-Federal land. To meet our timber goals, about 10 million acres of such land will require some form of Federal aid during the 10-year period beginning with fiscal year 1968. This program (authorized under Section 4 of Clarke-McNary Act of 1924) helps materially by providing planting stock for the Nation's needs for a wide variety of uses including:

- Timber production
- Wildlife habitat
- Watershed protection
- Recreation
- Rural beautification
- Special forest products

This program also assists the States in meeting increased costs for new equipment for extracting seeds, nursery operations, needed nursery maintenance and other related costs that continue to arise.

The War on Poverty needs trees for planting in impoverished rural counties to provide employment and develop timber resources in these areas. The 1968 objective is to assist the States in production of 600 million high quality seedlings for distribution to private landowners for reforestation of almost a million acres and shelterbelt planting on about 40,000 acres. This planting stock will, in many ways, aid in programs for:

- Beautification
- Cropland adjustment
- Agricultural conservation
- Watershed protection
- Appalachian forestry
- Rural areas development
- Forestry-based recreation

These programs compliment private forestation programs that depend upon planting stock for reforestation and shelterbelt plantings.

The 1966 Federal-State cooperation in the production and distribution of forest and shelterbelt planting stock, for use on non-Federal land, continues at about the 1965 level. The 48 cooperating States operate 98 nurseries that produced over 500 million trees for forestation and shelterbelt planting last year.

Examples of Recent Accomplishments

Special technical and financial help was provided two States in designing and constructing modern forest tree seed extractories and storage facilities. These new plants provide cold storage facilities for seed and planting stock that are necessary for efficient nursery operations.

The usual technical and financial assistance was continued. Emphasis was on helping with such technical problems as:

- Seeding
- Soil management
- Chemical weed control
- Insect and disease control
- Grading and packaging the planting stock
- Handling stock while enroute to the planting site

Improvement in nursery techniques, along with better field planting practices, are resulting in better survival, more rapid growth, and reduced costs for establishing a stand of forest trees or shelterbelts.

Some States continue to provide private landowners with seed for direct seeding where research has developed such practical reforestation methods.

A special study of seed orchards and production areas was made during the past year. There are now 153 seed orchards with over 3,000 acres growing improved seed from hybrids and selected strains for reforestation purposes. Also 294 seed production areas with over 8,500 acres are managed for seed selected stands.

The number of trees shipped to landowners during each of the past five fiscal years in comparison with all forest and shelterbelt trees produced by public and private nurseries is as follows:

<u>Year</u>	<u>Federal-State Cooperative Program</u>	<u>Other State Distribution</u>	<u>Total Output All Nurseries</u>
1962	670,000,000	28,000,000	1,100,000,000
1963	587,647,000	30,607,000	1,008,000,000
1964	535,429,000	43,174,000	948,312,000
1965	508,651,000	37,805,000	893,564,000
1966	521,000,000	50,530,000	864,705,000

Shipments for fiscal years 1967 and 1968 are expected to be about the same as those shown for 1966.

	1966	1967	1968	Increase
COOPERATION IN FOREST MANAGEMENT AND PROCESSING	\$3,535,000	\$3,546,000	\$3,546,000	-

No program increase is proposed.

This program is carried out in 49 participating States and Puerto Rico. It is aimed at rural areas and communities where forest resources provide an important part of the economic base on which the local people must rely for employment and income and on which industry must rely for needed present and future supplies of timber. The work is done in the woodlands owned by farmers and in other woodlands owned by miscellaneous, generally non-industry, private owners. Also, it is done at the small plants processing primary forest products. In addition to assistance on-the-ground, technical assistance is provided local community and area development groups.

Assistance is provided woodland owners in improving the management and utilization of their forest resources for timber, water, forage, recreation, fish, game, special products, and natural beauty. It includes such activities as:

- (1) Making forest resource inventories.
- (2) Planning for multiple use forest management.
- (3) Tree planting and seeding.
- (4) Improving timber stands.
- (5) Protecting forests from fire, pests and animals.
- (6) Harvesting and marketing forest products.

Assistance is also provided loggers and operators of small plants processing primary forest products. It includes harvesting equipment and methods, plant layout and operations, and marketing. Success in making full and effective use of existing forest resources depends largely on these activities. They are initial critical factors in obtaining the highest use and maximum value from forest products raw materials. They are especially important to areas supporting large volumes of low quality timber. They are of critical importance in supplying industry with sustained volumes of well manufactured lumber and other secondary products.

Assistance to community and rural area development groups includes such activities as:

- (1) Helping them to assemble data and interpret it in terms of opportunities for development and utilization of their forest resources.

- (2) Helping them to give appropriate attention to forest resources in preparing area development plans.
- (3) Bringing them in contact with specialists when needed.
- (4) Providing detailed information for feasibility studies.
- (5) Providing technical assistance in connection with planned forestry measures and practices.

In addition, supporting forestry service and assistance is provided such programs and activities as:

- (1) Agricultural conservation program
- (2) Appalachian Regional Program
- (3) Agricultural extension
- (4) Cropland adjustment program
- (5) Cropland conversion program
- (6) Farmers Home Administration forestry loans
- (7) National survey of recreational facilities
- (8) Resource conservation and development projects
- (9) Rural renewal projects
- (10) Soil and water conservation needs inventory

To accomplish the work that needs to be done, on-the-ground technical assistance is provided by professional foresters employed by the States in cooperation with the Federal government.

The following table shows major benefits that have been, or will be, obtained from Federal appropriations when matched with State appropriations.

Major Benefit	Unit	Fiscal Year 1966	Fiscal Year 1967	Fiscal Year 1968
Woodland owners given woodland management assistance	number:	113,000:	117,000:	117,000
Forest products operators given assistance	number:	10,500:	10,900:	10,900
Area of woodland involved	acres:	7,028,000:	7,275,000:	7,275,000
Volume of timber products sold or harvested	MBF:	817,000:	846,000:	846,000
Value of timber products sold or harvested	dollar:	19,884,000:	20,582,000:	20,582,000
Owners referred to consulting and industrial foresters for additional assistance	number:	2,900:	3,000:	3,000
Volume increase in Nation's production and supply of quality timber	cu. ft.:	457,548,000:	472,836,000:	472,836,000
Area of natural resource conservation improvements	acres:	4,022,000:	4,157,000:	4,157,000
Area of revegetation and improved range management	acres:	77,000:	80,000:	80,000
Area of improved watershed conservation	acres:	193,000:	199,000:	199,000
Area of improved wildlife habitat	acres:	18,000:	19,000:	19,000
Area of forestry practices contributing to natural beauty	acres:	2,500:	2,600:	2,600
Direct contributions to increased forest recreation availability and user capacity	number:	19,300:	19,900:	19,900
Employment resulting in rural areas	man-day:	3,268,000:	3,377,000:	3,377,000
Appropriation level:				
Federal		\$3,535,000:	\$3,546,000:	\$3,546,000
State		4,600,000:	4,900,000:	4,900,000
Total		8,135,000:	8,446,000:	8,446,000

:	:	:	:	:
:	1966	1967	1968	Increase
:	:	:	:	:
:GENERAL FORESTRY ASSISTANCE .	\$920,000:	\$1,471,000:	\$1,571,000:	+\$100,000:
:	:	:	:	:

An increase of \$100,000 is needed to provide professional services for increasing hardwood lumber output.

A program to improve the hardwood situation is essential. Forecasts indicate that housing starts will make an upturn in 1967. This should stimulate demand for flooring, paneling, kitchen cabinets and other house components made largely from hardwood. Furniture, pallet and crosstie markets are strong. The long-term trend indicates an increasing demand for hardwood lumber.

The three Hardwood Improvement Projects undertaken as a result of the fiscal year 1967 supplemental appropriation will be continued. Through the State forester's organizations services will be offered to forest landowners in the multiple use management, marking, sale and harvest of their hardwood timber. Assistance will be provided to loggers upon request, in improving the efficiency of their operations and bucking for grade. Assistance will be offered to sawmill owners in improving their manufacturing and seasoning processes and in cost reduction.

Dissemination of research findings in the field of forest products and feedback industry problems to forest products researchers will be facilitated.

Hardwood workshops will be arranged to provide the latest information on hardwood management; harvesting and processing for quality to foresters, landowners, loggers and sawmill owners.

Appalachian Regional Program. The objective in the Appalachian Regional Program through use of these funds is to improve social, economic and resource conditions in the region through providing:

- (1) Professional management services to woodland owners.
- (2) Professional assistance to loggers and processors of forest products in harvesting, manufacturing and marketing.
- (3) Assistance in the establishment of timber development organizations.
- (4) Program guidance and training.

These services are provided by the Forest Service and cooperating States and will directly and indirectly benefit the forest products industries, other related businesses and individuals throughout the Appalachian area. The cooperating States are reimbursed for part or all of the agreed upon costs which they incur in carrying out the stepped-up program of technical forestry assistance.

Regular Program. The objective of the regular General Forestry Assistance Program is to develop, maintain and improve the continuous and efficient production and use of the Nation's forests through:

- (1) Providing professional services in forest inventory, forest management, harvesting, processing and marketing to States, counties, other Federal agencies, forestry associations, economic development groups, forest products industries and operators and private owners of large forest properties who do not have professional people available to interpret and apply research findings.
- (2) Providing training, assistance and advice for State forestry personnel, industrial foresters and consultants.
- (3) Providing leadership and coordination to Forest Service efforts in national programs of social, economic and resource development.

Services provided through these funds lead to improvement of economic conditions and employment in rural communities.

The following table shows comparison of actual and estimated benefits from this program:

	<u>Unit</u>	<u>FY 1966</u>	<u>FY 1967</u>	<u>FY 1968</u>
Volume increase in Nation's supply of quality timber ...	millions of cu. ft.	871	871	1,000
Area of natural resource conservation improvements ..	thousands of acres	6,560	6,560	7,580
Employment resulting in rural areas	thousands of man-days	5,660	5,660	6,340
Assistance to marketing firms (cooperatives)	No.	20	20	20
	thousands of dollars	2,100	2,100	2,100
Forest products utilization assists	No.	525	550	600
New industry and business established or expanded	No.	92	92	100
	dollar value added to employment	6,760,000	6,900,000	8,000,000
	millions of bd. ft.	550,000	600,000	690,000

Examples of Recent Accomplishments

General forestry assistance work was increased in all States in fiscal year 1966. Assistance was provided to Rural Areas Development and other local and regional economic development groups in planning and carrying out programs to more fully utilize their forest resources for improving employment opportunities and income. Forest management and utilization work in Puerto Rico and the Virgin Islands was continued to help the people there make the fullest use of their forest resources.

The following tabulation shows accomplishments in fiscal year 1966:

	<u>Unit</u>	<u>Estimated Accomplishment</u>
Program workshops	No.	394
Program publications	No.	137
Program studies	No.	95
Forest management assists to large forest ownerships	No. Acres	883 38,725,000
Forest products utilization assists	No.	1,813
Inventories and surveys	No.	43
	Acres	39,318,000
Economic and marketing investigations	No.	245
Rural Areas Development assists	No.	459
Appalachian Regional Program:		
Woodland owners given management assistance	No.	4,650
Area of woodland involved	Acres	300,000
Forest products operators and processors assists	No.	350

FOREST ROADS AND TRAILS

Appropriation Act, 1967, and base for 1968	\$101,230,000
Budget Estimate, 1968	<u>110,500,000</u>
Increase	<u>+9,270,000</u>

PROJECT STATEMENT

The following tabulation reflects the total program for the construction and maintenance of roads and trails on the National Forests by combining the funds available under the appropriation "Forest roads and trails" with the permanent appropriation of 10% of National Forest receipts. This permanent appropriation for "Roads and trails for States" (10% Fund) is estimated at \$17,160,000 for 1968 compared with \$16,778,480 for 1967, an increase of \$381,520.

Project	1966	1967 Estimate	1968 Estimate	Increase or Decrease
1. Construction of roads and trails	\$77,016,582:	\$89,051,480:	\$118,160,000:	+\$29,108,520
2. Maintenance of roads and trails .. a/	40,514,546:	33,535,000:	19,000,000:	-14,535,000
Total obligations:	117,531,128:	122,586,480:	137,160,000:	+14,573,520
Transfer from "Roads and Trails for States":	-14,203,671:	-16,778,480:	-17,160,000:	-381,520
Program under "Forest Roads and Trails" contract authorization .	103,327,457:	105,808,000:	120,000,000:	+14,192,000
Obligations incurred under unfunded contract authorization .	-1,191,457:	-4,578,000:	-9,500,000:	-4,922,000
Total available or estimate	102,136,000:	101,230,000:	110,500,000:	+9,270,000

a/ Includes obligations incurred under Pacific Northwest Disaster Relief Act of 1965 (PL 89-41), approved 6/17/65:

1966	\$19,745,152
1967	15,604,848

Estimated obligations for Appalachian region (funds in connection with Appalachian Regional Development Act of 1965):

1966	\$2,250,000
1967	2,250,000
1968	2,191,000

An increase of \$9,270,000 is needed to meet cash requirements for liquidation of contract authorization. This appropriation provides for the liquidation of obligations incurred for the construction and maintenance of forest roads and trails pursuant to the authorization contained in the Federal-Aid Highway Act. An appropriation of \$110,500,000 for 1968 is required to:

(1) Pay for obligations of the prior year which will be due for payment in fiscal year 1968.

(2) Pay the portion of 1968 obligations of \$120 million contract authorization which will require cash payment in that year. This includes \$170 million 1968 authority made available by the Federal-Aid Highway Act of 1966 less: (a) \$3.3 million advanced to fiscal year 1967 for construction of timber access roads in Appalachian region and increased pay costs and, (b) \$46.7 million deferred to later years.

The presence or lack of access by road or trail has a direct and controlling influence on all aspects of forest management, protection, utilization, and development. An adequate system of forest development roads and trails must be installed and maintained to facilitate the maximum practicable yield and use of all forest resources on a sound sustained-yield basis.

Use of \$120 million of the contract authorization in 1968 will permit a start on full accomplishment of the long-range program. The first objective is to increase the amount of advance road construction by the Government prior to the sale of timber, thereby reducing the amount of timber purchaser road construction. This will enable the Government to proceed toward the objective of placing the timber program on the planned basis. Plans are being developed for adequate transportation systems in the new National Recreation Areas, on lands purchased under the Land and Water Conservation Fund Act, and on Forest Service lands where reservoirs are constructed by other agencies.

Following is a summary of the major road construction and restoration to be undertaken in 1968 as compared with fiscal years 1966 and 1967:

	FY 1966		FY 1967		FY 1968	
	Amount		Amount		Amount	
	Miles	(In thousands)	Miles	(In thousands)	Miles	(In thousands)
Recurrent road maintenance	113,417	\$15,136	114,664	\$14,738	116,459	\$16,000
Recurrent trail maintenance	102,947	4,335	102,744	3,192	102,500	3,000
Bridge construction (units)	212	3,141	200	4,348	210	7,100
Road construction	1,496	50,957	1,795	56,588	2,139	76,560
Trail construction ...	668	3,457	1,287	4,240	600	4,500
Surveys, plans, and supervision for timber purchaser roads	5,000	16,713	5,089	18,385	5,000	20,000
Supplementing timber purchaser roads	1,995	2,263	1,083	4,495	1,500	8,000
Road purchase		486		995		2,000
Flood and earthquake damage repairs		21,043		15,605		

Authorizations for Appropriations a/

<u>Fiscal</u> <u>Year</u>	<u>Construction</u>	<u>Maintenance</u>	<u>Total</u>	<u>Funded</u>	<u>Unfunded</u>
1966	\$69,800,000	\$53,200,000	\$123,000,000	\$123,000,000	-
1967	69,000,000	16,000,000	85,000,000	48,374,000	\$36,626,000
1968	<u>151,000,000</u>	<u>19,000,000</u>	<u>170,000,000</u>	<u>110,500,000</u>	<u>59,500,000</u>
	289,800,000	88,200,000	378,000,000	281,874,000	96,126,000

a/ The annual appropriation language and the Department presentation combine the appropriation for "Forest Roads and Trails" made pursuant to 23 USC 205 and the appropriation of 10% of forest receipts for construction and maintenance of roads and trails pursuant to 16 USC 501. This merger of funds is made in order to simplify the programing, allotment, and accounting of funds at the field level. Since the accounts for these two funds are merged, it is not practicable to distribute obligations and expenditures between the two appropriations on a precise basis. The amounts shown for the "Forest Roads and Trails" appropriation are a proration based on the percentage that contract authorization used under the appropriated funds is of total available funds. Expenditure amounts for maintenance are based on all such obligations requiring cash payment during the fiscal year.

Status of Unfunded Authorizations

Unfunded contract authorizations beginning of 1967:	
Federal-Aid Highway Act of 1964	\$137,856,000
Federal-Aid Highway Act of 1966 (1968 authorization available in 1967)	170,000,000
Appropriation, 1967	<u>-101,230,000</u>
Total unfunded beginning of 1968	206,626,000
1968 Budget estimate (cash requirements)	<u>110,500,000</u>
Balance to remain unfunded as of June 30, 1968	<u>96,126,000</u>

Analysis of Cash Requirements

1. Unliquidated obligations, June 30, 1966	\$45,409,941
2. Estimated cash requirements to finance 1967 program	<u>65,896,665</u> a/
3. Total cash requirements by June 30, 1967	111,306,606
4. Less cash on hand 1967: Balance from 1966	\$10,076,606
Appropriation, 1967	<u>101,230,000</u>
	111,306,606
5. Obligations in 1967 for which cash was not provided in item 2 .	39,911,000
6. Estimated cash required to finance 1968 program	<u>70,589,000</u> b/
7. Total cash required for 1968	<u>110,500,000</u>

a/ An estimated 61% of the \$90,203,000 new obligations and 70% of \$15,605,000 obligations for Pacific Northwest flood damages will require cash payments during the fiscal year.

b/ An estimated 59% of the \$120,000,000 new obligations will require cash payments during the fiscal year.



Land Access road. This type of road is usually constructed by the Government rather than the timber purchaser.



Land Use road. This type of road is sometimes constructed by the timber purchaser for an individual sale. Land use roads for other resource management purposes such as recreation and fire protection are constructed by the Government.



Project road. This type of road is constructed by a timber purchaser on the timber harvest area. These roads are "put to bed" when harvest is completed.



A project road that has been "put to bed". It now provides access for hunters, sightseers and others.

BEFORE



Unimproved primitive access road to a large recreation area.

AFTER



Dust-free safe road to same recreation area.

ACQUISITION OF LANDS FOR NATIONAL FORESTS, SPECIAL ACTS

Appropriation Act, 1967, and base for 1968	\$80,000
Budget Estimate, 1968	<u>80,000</u>

PROJECT STATEMENT

Project and Authority	1966	1967	1968 Estimate	Increase or Decrease
1. Cache National Forest, Utah, Act of 5/11/38, as amended ...	\$19,973	\$20,000	\$20,000	- -
2. Uinta-Wasatch National Forests, Utah, Act of 8/26/35, as amended	19,935	20,000	20,000	- -
3. Toiyabe National Forest, Nevada, Act of 6/25/38, as amended	7,638	8,000	8,000	- -
4. Angeles National Forest, California, Act of 6/11/40 ...	- -	- -	32,000	+\$32,000
5. Sequoia National Forest, California, Act of 6/17/40 ...	176	32,000	- -	-32,000
Unobligated balance reverted to National Forests Fund	32,278	- -	- -	- -
Total available or estimate	80,000	80,000	80,000	- -

The Congress has enacted several special laws which authorize appropriation from the receipts of certain specified National Forests for the purchase of lands to minimize erosion and flood damage. Amounts appropriated and laws under which authorized are shown above.

There are critical watershed lands needing soil stabilization and vegetative cover restoration to prevent serious erosion and damaging floods within these National Forests. Land treatment measures must be applied and subsequently maintained on all lands in these areas to make corrective action fully effective. To assure full program effectiveness, the intermingled private lands must be acquired by the Federal Government.

During fiscal year 1966, 1954 acres of land were purchased under the special purchase authorities applying to the Cache, Uinta and Wasatch National Forests in Utah. No lands were purchased in the National Forests of southern California in 1966.

Cache National Forest. In fiscal year 1966, funds were available from two sources for purchase of lands within the Cache National Forest in Utah.

1. The Receipts Act of May 11, 1938, as amended -- \$20,000. This is an annual appropriation.
2. The Act of July 24, 1956 -- \$200,000 was appropriated under this authority in fiscal years 1957 through 1960. These funds remain available until expended. Through fiscal year 1966, \$181,908 has been obligated from this appropriation.

These funds are used to acquire key tracts of land in the steep, rough, and highly important watershed areas lying north of the Ogden River along the Wasatch front and on Wellesville Mountain of the Cache National Forest. These are rugged mountain lands above the river valley which have been damaged and their watershed functions impaired through forest fires or overgrazing. This contributes to excessive rainfall runoff causing severe erosion. The damaged watershed lands are potential sources of floods and mudrock flows. Many tracts of land are located in the north fork of Ogden River and on the drainage of Pineview Reservoir, a Federal reclamation project. Others are within the watersheds of the city of Ogden and the other small towns along the Wasatch front. Public ownership of these lands and the subsequent restoration and protection of their vegetative cover is a highly important part of a vigorous cooperative program with the local community and agencies.

The 1956 Act requires that expenditures of Federal funds be matched by contributions by local agencies or people. This requirement has been met through donations of lands valued at \$185,000. Additional contributions are expected in fiscal year 1967.

The appropriation of \$20,000 under the Act of May 11, 1938, is from receipts of the Cache National Forest. In the absence of this appropriation, the local counties would receive 25% of these receipts for roads and school purposes. Therefore, the local counties, in effect, are contributing one-fourth of the amount of this appropriation. These appropriations are extremely important to the continuation of a vital and worthwhile program extending over twenty years and shared in by both the local agencies and the Federal Government through the National Forests.

Through fiscal year 1966, 30,323 acres have been approved for purchase pursuant to the Receipts Act of 1938, and 15,307 acres under the Special Act of 1956. The 1967 objective is to acquire 1,500 additional acres of these critical watershed lands.

Uinta-Wasatch. In fiscal years 1963 through 1967, an appropriation of \$100,000 was made under the Uinta-Wasatch Receipts Act of August 26, 1935 for acquiring critical watershed lands in the American Fork Canyon watershed. A total of 2,126 acres has been approved for purchase through fiscal year 1966 and an estimated 700 acres will be acquired during 1967. It is estimated that it will take from two to three years to complete the necessary American Fork acquisitions.

Sequoia National Forest. In each of fiscal years 1966 and 1967, \$32,000 was appropriated under this Act to acquire critical watershed lands. No lands were approved for purchase in fiscal year 1966 as no desirable tracts were available at reasonable prices. For this reason the transfer of this program to Angeles National Forest is proposed for fiscal year 1968. It is estimated that approximately 300 acres will be purchased during 1967.

Toiyabe National Forest. \$8,000 was appropriated under this Act in each of fiscal years 1966 and 1967. During fiscal year 1966 one very key tract of land was acquired to consolidate National Forest holdings. The 1967 objective is to acquire 300 additional acres of important watershed lands in the Toiyabe National Forest.

ACQUISITION OF LANDS FOR UINTA NATIONAL FOREST

Appropriation Act, 1967 and base for 1968	\$300,000
Budget Estimate, 1968	- -
Decrease	<u>-300,000</u>

PROJECT STATEMENT

Project	:	1966	:	1967	:	1968	:	Increase or Decrease
Acquisition of lands for Uinta National Forest	:	- -	:	\$300,000	:	- -	:	-\$300,000

Public Law 89-226 authorized the purchase of approximately 10,000 acres of non-Federally owned land within a described part of the Uinta National Forest in Utah for the purpose of promoting the control of floods and the reduction of soil erosion through restoration of adequate vegetative cover. \$300,000 were appropriated in fiscal year 1967. The lands to be acquired are located on the South Fork of the Provo River and constitute the watershed from which the City of Provo draws its municipal water supply. The lands are intermingled with, and surrounded by, National Forest land which is now the property of the United States and acquisition of the 10,000 acres authorized by Act would consolidate the National Forest area and not only serve to halt erosion and promote flood control, but facilitate administration of the National Forest.

As of December 31, 1966, 8,800 acres have been acquired at a cost of \$203,500. It is anticipated that essentially all of the remaining lands will be acquired by the end of fiscal year 1968.

ACQUISITION OF LANDS FOR WASATCH NATIONAL FOREST

PROJECT STATEMENT

Project	1966	1967	1968 Estimate
Acquisition of lands for Wasatch National Forest	- -	\$114,260	- -
Recovery of prior year obligations	-\$2,951	- -	- -
Unobligated balance brought forward	-111,309	-114,260	- -
Unobligated balance carried forward	114,260	- -	- -
Total available or estimate	- -	- -	- -

The Act of September 14, 1962 (PL 87-661) provided authorization for the appropriation of \$400,000 for purchase of privately owned lands within the Wasatch National Forest in Utah. The full amount of this authorization has been appropriated with the funds remaining available until expended.

As of June 30, 1966, approximately 10,000 acres had been acquired under this authority. It is expected that a large part of the remaining 9,000 acres will be acquired by the end of fiscal year 1968.

ACQUISITION OF LANDS FOR SUPERIOR NATIONAL FOREST

PROJECT STATEMENT

Project	1966	1967	1968 Estimate
Acquisition of lands for Superior National Forest	\$273,804	\$51,488	- -
Unobligated balance brought forward	-325,292	-51,488	- -
Unobligated balance carried forward	51,488	- -	- -
Total available or estimate	- -	- -	- -

The Act of June 22, 1948 (PL 80-733) as amended, provided authorization for the appropriation of \$4.5 million for the purchase of lands and improvements thereon in the Boundary Waters Canoe Area, Superior National Forest, Minnesota. The full amount of this authorization has been appropriated with the funds remaining available until expended.

The legislation authorized and directed the Secretary of Agriculture to acquire any properties which in his opinion should be in Federal ownership in order to restore and preserve the wilderness character of the remaining canoe country along the Canadian boundary in Minnesota.

This purchase program is in its final stages. No further purchase negotiations will be carried on under this authorization and the appropriated funds are all obligated.

ACQUISITION OF LANDS FOR CACHE NATIONAL FOREST

PROJECT STATEMENT

Project	1966	1967	1968 Estimate
Acquisition of lands for Cache National Forest	\$5,119	\$18,092	- -
Unobligated balance brought forward	-23,210	-18,092	- -
Unobligated balance carried forward	18,092	- -	- -
Total available or estimate	- -	- -	- -

The 1956 Appropriation Act provided \$200,000 for the acquisition of lands in the Cache National Forest pursuant to the Act of July 24, 1956 (70 Stat. 632). Obligations under this fund are in addition to the appropriation from National Forest receipts authorized by the Act of May 11, 1938 and provided in the appropriation, Acquisition of Lands for National Forests, Special Acts. Under the 1956 Act, funds appropriated must be matched by contribution of funds or land by local agencies or persons. Explanation of this program and the accomplishments thereunder are included on pages 125 and 126.



COOPERATIVE RANGE IMPROVEMENTS

Appropriation, 1967 and base for 1968	\$700,000
Budget Estimate, 1968	<u>700,000</u>

Part of the grazing fees from the National Forests, when appropriated, are used for revegetation of depleted rangelands, construction and maintenance of range improvements, rodent control, and eradication of poisonous plants and noxious weeds. These funds are advanced to and merged with the appropriation, Forest protection and utilization, subappropriation, Forest land management.

FORMULA FOR APPROPRIATION

Section 12 of the Act of April 25, 1950, (Granger-Thye Act) provides that of the money received from grazing fees by the Treasury from each National Forest during each fiscal year there shall be available at the end thereof when appropriated by Congress an amount equivalent to 2 cents per animal month for sheep and goats and 10 cents per animal month for other kinds of livestock under permit on such National Forest during the calendar year in which the fiscal year begins.

Since figures for animal months permitted are not available until after more than one-half of the fiscal year for which funds are appropriated has elapsed, the 1968 appropriation request of \$700,000 necessarily represents the best current approximation of the amount which will become available in the calendar year 1967 under the animal-months-permitted formula.

For calendar year 1965, the latest available figures, animal months permitted were 5,914,106 for cattle and horses, and 6,008,997 for sheep and goats. This calculates to \$711,590 available under the formula.

ASSISTANCE TO STATES FOR TREE PLANTING

Appropriation, 1967 and base for 1968	\$1,000,000
Budget Estimate, 1968	<u>1,000,000</u>

PROJECT STATEMENT

	1966	1967 Estimate	1968 Estimate	Increase or Decrease
Assistance to States for				
tree planting	\$972,677:	\$1,046,899:	\$1,000,000:	-\$46,899
Unobligated balance brought				
forward	-19,576:	-46,899:	- -	+46,899
Unobligated balance carried				
forward	46,899:	- -	- -	- -
Total available or estimate :	1,000,000:	1,000,000:	1,000,000:	- -

This program authorized under Section 401 of the Agricultural Act of 1956 (16 USC 568e) effectively assists the States in their reforestation programs. It has been responsible for directly speeding up the needed rehabilitation work on State and county forest lands. This program is making valuable contributions to the overall reforestation program for the Nation. To meet our timber goals, about 10 million acres will require some form of Federal tree planting aid during the 10-year period beginning with fiscal year 1968. Almost 2 million acres will require assistance through this program.

Through 1965, the program helped reforest about a half million acres. There are approved State plans for almost 1.3 million acres to be planted at an estimated Federal-State cost of \$41 million. Thirty-five States are participating. Thirteen States have 53 seed orchards with 1,517 acres for the production of genetically improved forest tree seed. This program is largely responsible for these important developments.

Following are the major benefits that have been or will be obtained from Federal appropriations when matched with State appropriations:

	Unit	FY 1966	FY 1967	FY 1968
Area planted or seeded	acres	90,000	100,000	100,000
Volume increase in Nation's production and supply of high quality timber	cu. ft.	10,000,000	10,500,000	10,500,000
Area of improved watershed conservation	acres	8,000	9,000	9,000
Area of improved wildlife habitat	acres	4,000	4,000	4,000
Area of forestry practices con- tributing to natural beauty ...	acres	6,000	7,000	6,000
Employment resulting in rural areas	man-days	100,000	120,000	120,000

: FY 1966 : FY 1967 : FY 1968

Appropriation level:

Federal	\$1,000,000	\$1,000,000	\$1,000,000
State	<u>2,400,000</u>	<u>2,500,000</u>	<u>2,500,000</u>
Total	3,400,000	3,500,000	3,500,000

TIMBER DEVELOPMENT ORGANIZATION LOANS AND TECHNICAL ASSISTANCE

PROJECT STATEMENT

Project	1966	1967 Estimate	1968 Estimate	Increase or Decrease
Loan and related expenses ..	- -	\$154,000:	\$746,000:	+\$592,000
Technical assistance	\$4,180:	45,820:	- -	-45,820
Unobligated balance brought forward	-950,000:	-945,820:	-746,000:	+199,820
Unobligated balance carried forward	945,820:	746,000:	- -	-746,000
Total available or estimate	- -	- -	- -	- -

In many areas of the Appalachian region, a chronic condition of underdevelopment and severe unemployment exists. As a result, many people are denied reasonable economic and cultural opportunities. In addition, the productive force in both physical and human resources is severely limited in its contribution to the Nation, while the costs of essential welfare services are steadily increasing. Technological advances have displaced the employment opportunity of many workers. This situation can be alleviated through purposeful and dynamic use of resources and technology available to us today. This region has great resources. Its people are productive and self-reliant.

At one time the Appalachian region was a center of lumber production. But when the lumber industry had harvested the virgin forests, production was drastically reduced. In its wake were left large areas of cut-over forest lands that have taken decades to regenerate to the extent that they can once again be regarded as usable resource. For these reasons, special supplementary forestry programs are being provided for the Appalachian region under authority provided in Section 204 of the Appalachian Regional Development Act of 1965.

ACCESS ROADS

PROJECT STATEMENT

Project	1966	1967	1968 Estimate
Access roads	\$53,951	\$9,274	- -
Unobligated balance brought forward ...	-63,224	-9,274	- -
Unobligated balance carried forward ...	9,274	- -	- -
Total available or estimate	- -	- -	- -

The unobligated balance from the fiscal year 1962 appropriation is \$9,274. During fiscal year 1966 one road system involving 19 miles of existing roads was purchased at a cost of \$53,950. The small remaining balance will be used to pay any excess awards which may result from settlement or trial of road condemnation cases initiated under this program.

Effective with fiscal year 1964, this appropriation was eliminated and future access road purchase, beyond that to be accomplished with the balance remaining in this appropriation, will be accomplished under the Forest Road and Trail appropriation.

ADMINISTRATIVE PROVISIONS, FOREST SERVICE

Changes in Language

Changes in language of this item are proposed as follows. New language is underscored. Deleted matter is enclosed in brackets.

- Appropriations to the Forest Service for the current fiscal year
- 1 shall be available for: (a) purchase of not to exceed [one] two
 - 2 hundred and [sixty-five] fifty-nine passenger motor vehicles of
 - 3 which one hundred and fifteen sixty-five shall be for replacement only, and hire of such vehicles; operation and maintenance of aircraft and the purchase of not to exceed four for replacement only; (b) employment pursuant to the second sentence of section 706(a) of the Organic Act of 1944 (5 USC 574), and not to exceed \$25,000 for employment under section 15 of the Act of August 2, 1946 (5 USC 55a); (c) uniforms, or allowances therefor, as authorized by the Act of September 1, 1954, as amended (5 USC 2131); (d) purchase, erection, and alteration of buildings and other public improvements (5 USC 565a); (e) expenses of the National Forest Reservation Commission as authorized by section 14 of the Act of March 1, 1911 (16 USC 514); and (f) acquisition of land and interests therein for sites for administrative purposes, pursuant to the Act of August 3, 1956 (7 USC 428a).

Except to provide materials required in or incident to research or experimental work where no suitable domestic product is available, no part of the funds appropriated to the Forest Service shall be expended in the purchase of twine manufactured from commodities or materials produced outside of the United States.

Funds appropriated under this Act shall not be used for acquisition of forest lands under the provisions of the Act approved March 1, 1911, as amended (16 USC 513-519, 521), where such land is not within the boundaries of an established national forest or purchase unit.

The three changes would provide authority for the Forest Service to purchase 259 passenger motor vehicles of which 165 will be replacements. The justification of this need follows:

PASSENGER MOTOR VEHICLES

Purchase of passenger motor vehicles

During fiscal year 1968, it is proposed to replace 165 passenger vehicles. Of these, 150 will meet replacement standards and 15 will require replacement because of accidents or excessive maintenance costs. It is also proposed to purchase 94 additional passenger cars. Of these, 69 will be used as replacements

or in lieu of additional one-half ton pickups and carryalls which are more expensive. The other 25 passenger motor vehicles will be additions to the Service-wide fleet to meet expanding program needs.

The Forest Service had a net fleet of 660 (includes 2 damaged vehicles disposed of in 1966 to be replaced in 1967) passenger carrying vehicles at the start of fiscal year 1967. It will add 45 units to its fleet during the fiscal year, making a total of 705 units available at the start of fiscal year 1968, excluding possible transfer to other agencies. It is proposed that the total number of passenger carrying vehicles be increased to 799 by the end of fiscal year 1968. Due to program needs, it may be necessary to replace sedans with station wagons or vice versa, but this would not change the total number of passenger motor vehicles scheduled for replacement or addition.

As of June 30, 1966, the age and mileage classes of the passenger vehicles on hand, exclusive of two buses, were:

<u>Age Data</u>		<u>Mileage Data</u>	
<u>Year</u>	<u>No. of Vehicles</u>	<u>Miles</u>	<u>No. of Vehicles</u>
1961 and older	68	60,000 and over	78
1962	128	50,000 to 59,999	99
1963	160	40,000 to 49,999	132
1964	130	30,000 to 39,999	121
1965	123	20,000 to 29,999	74
1966	90	10,000 to 19,999	90
		0 to 9,999	105
Total	699*	Total	699*

* Includes 39 vehicles on hand awaiting disposal.

Justification for Substitution of Passenger Carrying Vehicles for Light Trucks

As of June 30, 1966, the Forest Service operated a net fleet of 660 passenger carrying vehicles. In addition, the Forest Service has 7,919 one-half to one ton trucks, 2-wheel drive. It is now possible to advantageously substitute some passenger carrying vehicles for pickups and carryalls. The pattern of utilization in some areas requires a sedan or station wagon-type vehicle in lieu of a truck.

The sedan or station wagon costs less to operate and maintain than a truck. During fiscal year 1967, we are replacing 40 light trucks, such as carryalls, pickups, panels, and sedan delivery trucks, with sedans and station wagons. The total estimated cost savings is \$14,965 per year. If the Forest Service could substitute 69 passenger cars for light trucks in fiscal year 1968, this would result in an additional savings of about \$25,000 each year.

Use of Vehicles

Passenger motor vehicles are used by:

- (1) Forest officers in the protection, utilization, management, and development of the National Forests and land utilization projects and in the program for control of forest pests.
- (2) Research technicians on experimental forests and ranges, on field research projects and forest surveys.
- (3) Foresters engaged in carrying out the laws providing for State and private forestry cooperation.
- (4) Regional office field-going administrative personnel in performing, directing, and inspecting field work.

The Forest Service is essentially a field organization and its passenger motor vehicles are located mainly at regional, National Forest, and ranger district headquarters, and experimental forests and ranges. There are over 225 million acres within the exterior boundaries of the National Forests.

About 435 million acres of State and private forest land are included within the areas which benefit from Federal participation in the cooperative forest program. Much of this area is without common carrier service, and most forest areas and research centers are remote from commercial travel routes, requiring extensive use of motor vehicles as a means of transportation. The major portion of transportation needs, particularly at forest regional and supervisor levels and at other larger headquarters involves multiple passenger use and can be more expeditiously and economically met by use of sedans and station wagons than by other types of vehicles.

Justification of Replacements

Dependability of passenger vehicles is an important factor in keeping work programs on schedule and in meeting emergencies. Vehicle breakdowns while on field travel cause disruptions and delays in field work as well as loss of effective work time of employees. The continued use of over-age equipment is undesirable from a safety standpoint since most of it is operated over rough, narrow, winding roads in mountainous country under adverse conditions. This use generally results in excessive operating and repair expenses when vehicles reach or exceed replacement standards.

In order to maintain passenger cars in a safe and satisfactory operating condition, it is the policy of the Forest Service to schedule periodic preventive maintenance inspections, services, and tune-ups to reduce the necessity for costly repairs and major overhauls, and to minimize lost time resulting from field breakdowns.

It is desirable to maintain a reasonable balance in the age class of the passenger vehicle inventory. The age class distribution is based upon conforming with replacement standards which recognize that some units will be retired under the age standard and others under the use standard. Prescribed replacement standards, although applicable, are not always appropriate for all Forest Service vehicles because of the wide range of operating conditions and the comparatively short field season in many of the National Forests at higher elevations. Decision on replacement of passenger vehicles which reach replacement age is based on an appraisal of each unit. This involves a review of the history record combined with a mechanical inspection of the vehicle's condition and repair liability. When such appraisal indicates that the vehicle is satisfactory for further service without unreasonable repair expenditures, it is retained and assigned to lighter work, even though such action tends to upset the age standards for the fleet inventory.

The vehicles selected for replacement are those which cannot be operated another season without excessive repair expense. They are unsatisfactory for further use both as to safety and mechanical condition. The replacement authorization requested is within the normal annual replacement standards prescribed by the General Services Administration.

Essentially all passenger motor vehicles are pooled for use by all activities with replacement of pooled units financed from a Working Capital Fund. All appropriations reimburse this fund in ratio to use of vehicles on activities financed by the respective appropriations.

None of the replacements requested will be assigned to areas served or scheduled to be served by Inter-Agency Motor Pools.

Justification of Additions

The Forest Service analyzes current work plans and program in determining its overall passenger car requirements. This analysis includes a careful study of the number of vehicles needed at each field station, using as a guiding principle the ownership of only the minimum number of dependable units required to serve programs for which funds are budgeted. Also, it is Forest Service policy to utilize Inter-Agency Motor Pools or commercial car rental services to the fullest practicable extent. Passenger car use is restricted and is integrated with various activities so as to attain good utilization of all vehicles. Expanding activities in research, timber sales, public use of recreational facilities, fire protection, and other land management activities are increasing the need for more passenger cars. These increasing needs are being met in some areas through greater use of Inter-Agency Motor Pool vehicles. These pools, however, serve only very small parts of the total land area administered by the Forest Service; therefore, increasing requirements for passenger car transportation in several areas cannot be fully met except through purchase of additional units for the Forest Service fleet. None of the additions requested will be assigned to areas served or scheduled to be served by Inter-Agency Motor Pools.

Additions are financed from program funds in direct relationship to the anticipated use of the equipment. Distribution of costs to appropriations is based on analysis of use of the equipment fleet for the past three years and the estimated use for the budget year.

AIRCRAFT

Replacement of Aircraft

The 1968 estimates propose replacement of four aircraft by purchase and four by transfer from other agencies as available. The Forest Service currently has 57 aircraft:

- 11 single-engine reconnaissance and transport airplanes
- 13 light twin-engine reconnaissance and transport airplanes
- 13 medium and heavy cargo and transport airplanes (9 medium,
4 heavy)
- 19 T-34B lead airplanes (2-place scout)
- 1 helicopter

The reconnaissance and transport airplanes are multipurpose aircraft used primarily to transport firefighters, smokejumpers, administrative personnel, equipment and supplies to remote and inaccessible areas where commercial service is inadequate, or not available for detection and suppression of forest fires. They are also used to locate and survey timber stand and vegetation conditions, such as insect infestations, blowdown, diseased areas, undesirable species, and to appraise resources and damage, and evaluate effectiveness of control. One light twin-engine airplane has been modified, equipped and is used primarily for fire mapping with infrared equipment in low visibility of smoke and at night.

The T-34B "lead" airplanes are primarily a single-purpose military model aircraft used by air tanker bosses to direct and control the dropping of fire retardants on forest fires by more than 120 tanker aircraft usually contracted from private owners.

The helicopter is used for training forest personnel in tactical use of helicopters and experimental development of techniques and equipment for direct tactical suppression of forest fires. It is currently assigned on the study project to develop safe and effective use of helicopters at night on fires.

The replacements requested will be primarily light twin-engine airplanes. They will be utility airplanes that may be used for several purposes, such as lead planes for air tankers, small paracargo dropping, reconnaissance, and transporting freight and passengers. These will be new standard manufactured airplanes to upgrade with greater utility some old surplus T-34B's and single-engine reconnaissance airplanes which have reached an age in total number of flying hours where it is uneconomical to overhaul or modernize

them to meet civil airworthiness requirements. These replacements will provide a more effective operation, with the wider twin-engine operation safety margin. Forest Service aircraft are operated to a large extent over rough mountainous terrain where landing fields are poor and few. It is especially important that these aircraft be maintained for maximum performance and dependability to provide an adequate standard of safety.

Other aircraft currently in use may be replaced as newer and more suitable models and types become available from military services as excess property. They would be obtained on transfer without reimbursement and would not increase the fleet beyond 57 aircraft. Medium and heavy cargo and transport airplanes are needed to meet requirements as a result of rapidly diminishing number available from supplemental air carriers and other commercial sources. When aircraft are partially or completely destroyed in a crash accident, they may be replaced out of any available fund. The majority of current Forest Service aircraft were manufactured during World War II, and obtained from military surplus. Most of these planes have nearly reached their limit of useful age. The military services have a few types of aircraft which have more potential suitability for Forest Service work that may become surplus in the near future.

ROADS AND TRAILS FOR STATES, NATIONAL FORESTS FUND

Appropriation, 1967	\$16,778,480
Budget Estimate, 1968	<u>17,160,000</u>
Increase (due to an estimated increase in National Forest receipts in fiscal year 1967)	<u>+381,520</u>

The permanent appropriation of 10% of National Forest receipts pursuant to the Act of March 4, 1913 (16 USC 501) is transferred to and merged with the annual appropriation for Forest Roads and Trails. The explanation of the use of these funds is included in the justification for that appropriation item.

EXPENSES, BRUSH DISPOSAL

Appropriation, 1967 and base for 1968	\$10,200,000
Budget Estimate, 1968	<u>10,300,000</u>
Increase	<u>+100,000</u>

PROJECT STATEMENT

	: : 1966	: : 1967 : Estimate	: : 1968 : Estimate	: Increase or : Decrease
Brush disposal	: \$9,004,649	: \$9,500,000	: \$9,600,000	: +\$100,000
Unobligated balance brought forward	: : -9,987,145	: : -11,178,168	: : -11,878,168	: : -700,000
Unobligated balance carried forward	: : 11,178,168	: : 11,878,168	: : 12,578,168	: : +700,000
Total available or estimate ..	: <u>10,195,672</u>	: <u>10,200,000</u>	: <u>10,300,000</u>	: <u>+100,000</u>

Timber cutting normally increases the fire hazard because of dry fuel increase in the form of logging slash. This slash may also contribute to the buildup of insect populations, increase certain disease infestations, and cause damage to stream channels.

National Forest timber sale contracts require treatment of debris from cutting operations or deposit of funds to pay for the work. When economical and expedient the work is performed by the timber purchaser. If it is not feasible for the purchaser to do the work, it is done by the Government using deposits made by the timber purchaser to cover costs of the work as authorized under section 6 of the Act of April 24, 1950 (16 USC 490).

The effect of timber cutting and the manner of treating slash vary widely among regions. In the three eastern regions, volume cut per acre is relatively low, utilization is high, and generally, humid atmospheric conditions result in rapid decomposition of debris so little slash disposal work is necessary. An exception occurs in some sales where a heavier cut per acre is made, such as the jack pine stands of Minnesota. In such areas, slash is broken up and mixed with mineral soil by discing with heavy equipment. This reduces the hazard and provides a good seedbed to aid regeneration. Treatment of slash to prevent insect epidemics is sometimes necessary in these areas.

In contrast, the cost of slash abatement on most sale areas of the West is high. High volumes per acre generally produce heavy slash. Long dry periods with much lightning and man-caused fire risk result in extremely hazardous fire potential. The warm, humid condition necessary for rapid slash deterioration seldom occurs so more intense slash disposal is required. Treatment varies greatly with different methods of cutting. Clear-cut areas are broadcast burned. In selectively cut areas, debris may be piled for burning over the whole area or in strips which serve as firebreaks.

While slash disposal follows general prescriptions within regions, individual needs of each sale offering are planned and appraised prior to advertisement and appropriate specific requirements are incorporated into each timber sale contract. In each instance the method used is the one which will attain adequate protection of the area at the least expense. In some instances adequate protection from fire is attained by providing additional protection until the slash hazard reverts to near normal. Logging debris which may move into water courses under these conditions must be removed. Greater intensity of fire protection for several years and occasional stream clearance may be less costly than complete slash disposal immediately after cutting. In such cases Brush Disposal funds are used to provide the needed manpower and facilities.

FOREST FIRE PREVENTION

Appropriation, 1967 and base for 1968	\$45,000
Budget Estimate, 1968	<u>45,000</u>

PROJECT STATEMENT

Project	1966	1967 Estimate	1968 Estimate	Increase or Decrease
Forest fire prevention	\$23,892	\$42,000	\$47,000	+\$5,000
Unobligated balance brought forward	-45,041	-64,195	-67,195	-3,000
Unobligated balance carried forward	64,195	67,195	65,195	-2,000
Total available or estimate	43,046	45,000	45,000	- -

The purpose of the project is public education on the need for the prevention of man-caused wildfires on all the Nation's forests and rangelands. Its goal is the further reduction of man-caused forest fires on all ownerships to the point where their impact on natural resource management programs is negligible.

This project is accomplishing its purpose in two ways:

1. By the dissemination to the public of Smokey Bear's forest fire prevention messages on commercial products licensed by the Chief of the Forest Service.
2. By support of the Smokey Bear Junior Forest Rangers and of the Smokey Bear Awards program through the contribution of fees and royalties by licensees.

The Smokey Bear licensing program is an important part of the Cooperative Forest Fire Prevention Campaign which has been in effect for 25 years. The campaign itself has been conducted each year since 1942 as a cooperative project of the State Foresters and the Forest Service, United States Department of Agriculture, and is a public service program of the Advertising Council. The campaign utilizes the free public service resources of the various national advertising channels such as car cards, poster display systems, radio and television networks, and magazine and newspaper allocation plans in developing public cooperation in the prevention of man-caused forest fires. Since 1945, this campaign has been built around Smokey Bear who has become recognized and accepted by the public as a nationwide symbol of forest fire prevention.

Under authorization of the Act of May 23, 1952 (18 USC 711), the Secretary of Agriculture has issued rules and regulations governing the licensing program. These licenses specify payment of royalties (usually 5%) and set up certain controls for administering the program and collecting the royalties including advance deposits to protect the Government's interest. Such collections, along with appropriated funds, are used to finance the Cooperative Forest Fire Prevention Campaign.

The licensing program provides about one-tenth of the total funds required for the Cooperative Forest Fire Prevention Program.

Examples of Recent Accomplishments

In fiscal year 1966, receipts from the commercial support educational programs were \$43,046. These receipts came from 43 licensees.

Thanksgiving Day, Smokey Bear was featured twice on network television. A sixty-foot Smokey Bear balloon was in the Macy's Parade in New York City in the morning and in the evening an hour long color film titled "Ballad of Smokey Bear" was presented. The viewing audience for each of these programs is estimated at 50 million people. A forest fire prevention float was entered for the second successive year in the Pasadena Rose Parade on New Year's Day. The estimated television audience for the parade was 100 million people. The 1966 forest fire prevention film spot "Family Trees" won top honors for TV shorts and spots presented by the National Committee on Films for Safety.

New commercial Smokey Bear items included a book, "Letters to Smokey Bear," silver charm, electric clock, record, and sweat shirt.

State and Federal units purchased Smokey Bear material valued at \$179,000 for the 1966 Campaign to supplement the material valued at \$85,000 printed for them with appropriated funds.

RESTORATION OF FOREST LANDS AND IMPROVEMENTS

Appropriation, 1967 and base for 1968	\$25,000
Budget Estimate, 1968	<u>25,000</u>

PROJECT STATEMENT

Project	:	1966	:	1967 Estimate	:	1968 Estimate	:	Increase or Decrease
Restoration of forest lands and improvements	:	\$23,259:	:	\$39,979:	:	\$25,000:	:	-\$14,979
Unobligated balance brought forward	:	-18,443:	:	-14,979:	:	- -	:	+14,979
Unobligated balance carried forward	:	14,979:	:	- -	:	- -	:	- -
Total available or estimate	:	<u>19,795:</u>	:	<u>25,000:</u>	:	<u>25,000:</u>	:	<u>- -</u>

Recoveries from cash bonds or forfeitures under surety bonds by permittees or timber purchasers, who fail to complete performance, are used to complete improvement, protection, or rehabilitation work on lands under Forest Service administration. Funds received as settlement of a claim are used for improvement, protection, or rehabilitation made necessary by the action which led to the cash settlement (Act of June 20, 1958, 16 USC 579c).

PAYMENT TO MINNESOTA (COOK, LAKE, AND ST. LOUIS COUNTIES)
FROM THE NATIONAL FORESTS FUND

Appropriation, 1967 and base for 1968	\$144,815
Budget Estimate, 1968	<u>145,000</u>
Increase	<u>+185</u>

PROJECT STATEMENT

Project	:	:	1967	:	1968	:	Increase or
	:	1966	:	Estimate	:	Estimate	Decrease
Payment to Minnesota from the National	:	:	:	:	:	:	:
Forests Fund (total available or	:	:	:	:	:	:	:
estimate)	:	\$140,619	:	\$144,815	:	\$145,000	+\$185
	:	:	:	:	:	:	:

The Act of June 22, 1948, as amended (16 USC 577c-577h) provides that the Secretary of the Treasury, upon certification of the Secretary of Agriculture, shall pay to the State of Minnesota at the close of each fiscal year an amount equivalent to three-fourths of one percent of the fair appraised value of certain National Forest lands in the counties of Cook, Lake, and St. Louis situated within the Superior National Forest. The Act further provides that payment to the State shall be distributed to each of these counties in conformity with the fair appraised value of such National Forest lands in each county.

PAYMENTS TO COUNTIES, NATIONAL GRASSLANDS

Appropriation, 1967 and base for 1968	\$431,250
Budget Estimate, 1968	<u>431,250</u>

PROJECT STATEMENT

Project	:	1966	:	1967 Estimate	:	1968 Estimate	:	Increase or Decrease
Payment to counties (total available or estimate)	:	\$429,041:	:	\$431,250:	:	\$431,250:	:	- -

At the end of each calendar year, 25% of the revenues from use of submarginal lands are paid to counties under the provisions of Title III of the Bankhead-Jones Farm Tenant Act, approved July 22, 1937 (7 USC 1012). Payments are made on the provision that they are used for school or road purposes, or both.

PAYMENTS TO SCHOOL FUNDS, ARIZONA AND NEW MEXICO

Appropriation, 1967 and base for 1968	\$102,931
Budget Estimate, 1968	<u>105,000</u>
Increase (due to an estimated increase in National Forest receipts in fiscal year 1967)	<u>+2,069</u>

PROJECT STATEMENT

Project	: 1966	: 1967 : Estimate	: 1968 : Estimate	: Increase or : Decrease
Payments to school funds (total available or estimate)	: \$112,130	: \$102,931	: \$105,000	: +\$2,069

Under provisions of the Act of June 20, 1910 (36 Stat. 562, 573) certain areas within National Forests were granted to the States for school purposes. The percentage that these lands are of the total National Forest area within the State is used in determining payments to the States. The receipts from all National Forest land within the State are used as the basis for applying the percentage. For example, if total receipts for the State are \$100,000 and if 10% of lands are in the "granted for school purposes" category, the payment to the State would be \$10,000. The amounts so paid are deducted from the net receipts before computing the 25% payments to States.

As soon after the close of the fiscal year as the receipts from National Forests and the area of school lands in the States of Arizona and New Mexico are determined, the payments are made to the States. Estimated payments in fiscal year 1967 to Arizona will be \$102,572 and to New Mexico \$359.

PAYMENTS TO STATES, NATIONAL FORESTS FUND

Appropriation, 1967 and base for 1968	\$41,942,319
Budget Estimate, 1968	<u>42,900,000</u>
Increase (due to an estimated increase in National Forest receipts in fiscal year 1967)	<u>+957,681</u>

PROJECT STATEMENT

Project	1966	1967 Estimate	1968 Estimate	Increase or Decrease
Payments to States (total available or estimate) .	\$35,504,367	\$41,942,319	\$42,900,000	+\$957,681

The Act of May 23, 1908, as amended (16 USC 500) requires, with a few exceptions, that 25% of all money received from the National Forests during any fiscal year be paid to the States in which the forests are located, for the benefit of public schools and public roads of the county or counties in which such National Forests are situated. The amount of this appropriation varies each year in direct proportion to National Forest receipts during the previous fiscal year.

The amounts set aside from receipts collected for the sale of National Forest timber, grazing, special use permits, power, mineral leases, and admission and user fees, before the 25% is applied are listed below:

1. Payment to the State of Minnesota covering certain National Forest lands in the Counties of Cook, Lake, and St. Louis situated within the Superior National Forest is made under the terms of the Act of June 22, 1948, as amended (16 USC 577c-577h). Receipts collected from the areas covered by this Act are excluded when the 25% payment to the State of Minnesota is computed.
2. For lands in certain counties in Utah, Nevada, and California, the States receive 25% of receipts only after funds, if made available by Congress, have been set aside for the acquisition of National Forest lands within the specified National Forests under the terms of special acts authorizing appropriations from forest receipts for this purpose.
3. Payments to the States of Arizona and New Mexico under the provisions of the Act of June 20, 1910 (36 Stat. 562, 573), of shares of the gross receipts from the National Forests in those States which are proportionate to the areas of land granted to the States for school purposes within the National Forests.

WORKING CAPITAL FUND, FOREST SERVICE

The Working Capital Fund was established by the Act of August 3, 1956 (16 USC 579b), as amended by the Act of October 23, 1962 (76 Stat. 1157). It is a self-sustaining revolving fund which provides services to National Forests, experiment stations, and when necessary, to other Federal agencies, and as provided by law, to State and private agencies and persons who cooperate with the Forest Service in fire control and other authorized programs.

The Working Capital Fund requires no cash appropriation. Initially, its assets were purchased by regular Forest Service appropriations and were donated to the fund. Where expansion of facilities, equipment, and inventories is required, the expansion is financed pro rata by benefiting Forest Service appropriations and the additional assets are donated to the fund. Some additional assets have been obtained from excess sources without cost to Forest Service appropriations or the Working Capital Fund. Some expansion was financed by profits realized in the first few years of operation of the fund. Since July 1, 1962, expansion has been financed by benefiting Forest Service appropriations.

Since July 1, 1962, some earnings have been applied to the excess of replacement cost over original cost of equipment replaced. Some earnings have been reserved for future excess replacement costs of equipment. The balance of accumulated earnings is limited to not more than 5% of gross income for one year to provide working capital. This is an administratively imposed limitation which restricts earnings but does not require additional profits to meet the standard whenever working capital is adequate.

The following is a tabulation of information pertaining to the capital and earnings of the Working Capital Fund:

Analysis of Capital and Earnings (In thousands)

	Actual through <u>June 30, 1966</u>	Estimated through <u>June 30, 1967</u>	Estimated through <u>June 30, 1968</u>
Value of assets donated to the fund	\$29,993	\$30,894	\$31,894
Earnings applied prior to 7/1/62 to additional equipment and excess replacement costs	3,751	3,751	3,751
Earnings applied since 7/1/62 to excess replacement costs	1,915	3,307	4,207
Earnings reserved to cover future excess replacement costs	2,021	1,800	1,711
Earnings to provide working capital for operation	<u>- -</u>	<u>202</u>	<u>202</u>
Total	37,680	39,954	41,765

The following services are provided by the Working Capital Fund:

1. Equipment Service. This service owns, operates, maintains, and replaces common use motor driven and similar equipment. This equipment is rented to National Forests, experiment stations, and in some cases, other agencies, at rates which recover the cost of operation, repair and maintenance, management, and depreciation. The rates also include an increment which provides additional cash which, when added to depreciation earnings and the residual value of equipment, provides sufficient funds to replace the equipment.
2. Aircraft Service. This service operates and maintains Forest Service owned aircraft used in fire surveillance and suppression and in other Forest Service programs. The aircraft are rented to National Forests, experiment stations, and in some cases, to other agencies, at rates which recover the cost of operation, maintenance, repair, and improvements in the airworthiness of the aircraft. Replacement costs and the costs of additional aircraft are financed pro rata by benefiting Forest Service appropriations.
3. Supply Service. This service operates the following common services:
 - (a) Central Supply. This is a centralized service for procurement, warehousing, and supply of common use items, such as work project tools, provisions, and supplies, which are issued and sold to National Forests, experiment stations, and others at prices which recover cost.
 - (b) Photo reproduction. These facilities store, reproduce, and supply aerial photographs, aerial maps, and other photographs of National Forest lands. The photographic reproductions are sold to National Forests, experiment stations, and others at cost.
 - (c) Sign Shop. These are small shops which manufacture and supply special signs for the National Forests for use in regulating traffic and as information to the public and other users of the National Forests. The signs are sold to National Forests and experiment stations at cost.
 - (d) Subsistence. These are facilities which prepare and serve meals at cost to Forest Service work crews in remote areas where adequate public restaurant facilities are not available.
 - (e) Cribbing. This facility manufactures special concrete structural material used in embankments along access roads in the National Forests. This material is sold to National Forests at prices which recover costs.
4. Nursery Service. This service operates forest tree nurseries and cold storage facilities for storage of tree and seed stock. Tree seed is procured, cleaned, bagged, and stored in refrigerated facilities. Tree and seed stock are sold to National Forests, States, and other Federal agencies at cost.

COOPERATIVE WORK, FOREST SERVICE (TRUST FUND)

Contributions are received from cooperators, including counties, States, timber sale operators, individuals, and associations, and are expended by the Forest Service in accordance with the terms of the applicable cooperative agreements. The work consists of protection and improvement of the National Forests, work performed for National Forest users, and forest investigations and protection, reforestation, and administration of private forest lands.

The major programs conducted under this account are described below in terms of the projects reflected in the statement at the end of this section.

1. Construction and Maintenance of Roads and Trails, and
2. Construction and Maintenance of Other Improvements.

Under the Acts of June 30, 1914 (16 USC 498) and March 3, 1925, April 24, 1950 (16 USC 572) and October 13, 1964 (16 USC 537) deposits for cooperative work are accepted from State and local government agencies, associations, Federal timber purchasers, users of roads, and others for the construction and maintenance of roads, trails, and other improvements and for performing work which is the National Forest users' responsibility, this method of performance of the work being of mutual benefit or of benefit to the public at large. Cooperative deposits received for wildlife habitat improvement for States from their hunting and fishing fees are included in this activity.

3. Protection of National Forest and Adjacent Private Lands. The Act of June 30, 1914 (16 USC 498) authorizes the acceptance of deposits for the protection of the National Forests and the Act of March 3, 1925, as amended by Section 5, Act of April 24, 1950 (16 USC 572), authorizes the acceptance of contributions for the protection of private lands in or near the National Forests. The major portion of the obligations is for the protection of private lands from fire. This arrangement helps both parties since there are millions of acres of private forest land intermingled with Federal ownership on the National Forests. The lands in private ownership are usually in small tracts. It would be uneconomical for the owner to set up a fire control organization for the protection of his land. The advantage to the Government is that in many cases it would be necessary to suppress the fires on the private land without reimbursement in order to protect the adjoining Federal land.
4. Sale Area Betterment (including reforestation). Section 3 of the Act of June 9, 1930 (16 USC 576b) provides for deposits of funds by timber sale purchasers to cover the cost of reforestation and special cultural measures to improve the future stand of timber on the areas cutover by the purchaser. Deposits in fiscal year 1966 under this authorization totaled \$22.6 million. Fiscal year 1966 accomplishments under this program are reported under the Forest land management subappropriation along with accomplishments for reforestation and stand improvement for that subappropriation.

5. Scaling. Under provisions of the Act of April 24, 1950 (16 USC 572) and of Section 210 of the Act of September 21, 1944 (16 USC 572a) acceptance of deposits from timber purchasers for cooperative scaling service is authorized. Such arrangements are established only when requested by the operator and when the operator pays the extra cost of such services, either in advance or through reimbursement under appropriate payment guarantees.
6. Research Investigations. The Acts of June 30, 1914 (16 USC 498) and May 22, 1928 (16 USC 581i-1) authorize the acceptance of deposits for forestry research. Deposits are received from State and other public agencies, and from industrial, association, and other private agencies to finance research projects of mutual interest and benefit to both parties. The deposits may be made either in a single sum or on a continuing basis, and may either partially or wholly cover the cost of the research. The cooperative research projects may involve any aspect of forestry and vary widely as to scope and duration. A very common example of such cooperation is for a State to make a deposit to the Cooperative work fund in order to intensify or to speed up completion of a comprehensive survey of the forest resources of the State. Other examples are State contributions toward forest fire research. The results of such cooperative investigations are made available to the general public as well as to the depositor.
7. Administration of Private Lands. The Act of March 3, 1925, as amended by Section 5, Act of April 24, 1950 (16 USC 572) authorizes the acceptance of contributions for the management of private lands. These contributions are made by private owners having land intermingled with or adjacent to National Forests who wish these lands managed in accordance with good forest management practices. Their holdings are usually too small to warrant the employment of professional foresters to administer such tracts. The advantages to the Government include the avoidance of possible high fire hazard areas resulting from improper cutting practices, the elimination of the necessity of precisely marking the boundaries of the private land, and additional private forest land handled under proper forest practices.
8. Reforestation (private lands). The Act of March 3, 1925, as amended by Section 5, Act of April 24, 1950 (16 USC 572) authorizes the acceptance of contributions for reforestation of private lands situated within or near a National Forest. This work is limited to areas of private land within a planting project on the National Forests or to areas in which certain civic and other public-spirited organizations have taken an interest.
9. Statement on Utilization of Funds. Following is a statement of funds received and obligated and balances available by major activities:

COOPERATIVE WORK, FOREST SERVICE
Trust Fund

Project	Actual Fiscal Year 1966			Estimate Fiscal Year 1967			Estimate Fiscal Year 1968		
	Balance Available June 30, 1965	Funds Received	Obligations	Balance	Funds Received	Obligations	Balance	Funds Received	Obligations
1. Construction and maintenance of roads and trails	\$1,181,030	\$1,932,751	\$1,513,829	\$1,599,952	\$1,930,000	\$1,930,000	\$1,599,952	\$1,930,000	\$1,930,000
2. Construction and maintenance of other improvements	608,011	541,497	595,697	553,811	540,000	540,000	553,811	540,000	540,000
3. Protection on National Forests and adjacent private land:									
(a) Fire	533,002	1,957,296	1,985,582	504,716	1,955,000	1,955,000	504,716	1,955,000	1,955,000
(b) Other	1,289,333	1,612,298	1,366,723	1,534,908	1,600,000	1,600,000	1,534,908	1,600,000	1,600,000
4. Sale area betterment on National Forest lands (including re- forestation)	32,100,873	22,576,232	17,957,006	36,720,099	22,095,000	22,095,000	36,720,099	23,095,000	23,095,000
5. Scaling of timber	238,843	902,185	869,628	271,400	900,000	900,000	271,400	900,000	900,000
6. Research investigations	278,991	922,422	845,045	356,368	920,000	920,000	356,368	920,000	920,000
7. Administration of private lands	9,470	15,306	13,538	11,238	15,000	15,000	11,238	15,000	15,000
8. Reforestation (private lands) ..	89,108	46,428	37,064	98,472	45,000	45,000	98,472	45,000	45,000
Subtotal	36,328,661	^{a/} 30,506,415	25,184,112	41,650,964	30,000,000	30,000,000	41,650,964	31,000,000	31,000,000
Advanced to FOREST PROTECTION AND UTILIZATION for fighting forest fires									
b/			3,800,000	-3,800,000		-3,800,000			
Total	36,328,661	30,506,415	28,984,112	37,850,964	30,000,000	26,200,000	41,650,964	31,000,000	31,000,000

^{a/} Includes \$1,279 reimbursed to appropriation.

^{b/} Reflects obligations in 1966 for fighting forest fires which were recovered from the 1967 appropriation for fighting forest fires.

NOTE: Balances carried forward are due primarily to necessity of deferring work for which funds are deposited until the most practicable time. For instance, funds for sale area betterment are received in advance of cutting, but work cannot be started until cutting operations are completed. The time lag sometimes extends for several years, depending on the amount of preparatory work required in the sale area and weather conditions.

Above obligations for 1966 include:

(1) Transfers to National Forests Fund of earned sale area betterment deposits in excess of obligations for sale area betterment work	\$145,616
(2) Refunds to cooperators	166,321
	<u>\$311,937</u>



